

1. Most common species of pseudomonas causing intravascular catheter related infections is ?

a) P. cepacia

b) P. aeruginosa

c) P. maltiphila

d) P. mallei

Correct Answer - B

P. aeruginosa [Ref- Harrison 17 th/e p. 838, 839; The Internet journal of Anaesthesiology]

Most common species of pseudomonas associated with intravascular catheter is Pseudomonas Aeruginosa.

Intravascular catheter related infections

- Indwelling vascular catheters are a leading source of bloodstream infections.
- Amongst indwelling vascular catheters, *central venous catheters are the most common culprits.*

Pathogenesis

- There are four potential sources for catheter related infections ?
 - 1) *The skin insertion site*
 - 2) *The catheter hub*
 - 3) *Hematogenous seeding from a distant infection*
 - 4) *Contaminated infusate*
- *The skin insertion site and the catheter hub are by far the two most important sources.*
- *Approximately 65% of catheter related infections originate from the skin flora, 30% from the contaminated hub and 5% from other*

pathways.

- For short term catheters, *skin contamination is the most likely mechanism of pathogenesis.*
- On the other hand, for long term catheters, *hub contamination is more frequent because such catheters often have to be intercepted and manipulated.*
- *Skin organisms* migrate from the skin insertion site along the *external surface of catheter*, colonizing the distal intravascular tip of the catheter, and ultimately causing blood-stream infection. On the other hand, in hub related infections, organisms are usually introduced into the hub *from the hands of medical personnel* and the organisms migrate along the internal surface of the catheter, where they can cause a bloodstream infection.

Microbiology

- Most of the micro-organisms implicated in CRIs arise from the skin flora.
- *Staphylococci are the most frequently isolated pathogens, particularly coagulase-negative staphylococci.*

Etiology of catheter related infection

Microorganism	Percentage
• Coagulase negative staphylococci	30 - 40
• Staph aureus	5 - 10
• Enterococci	4 - 6
• Candida spp.	3 - 6
• <i>Pseudomonas aeruginosa</i>	2 - 5
• Enterobacter spp	1 - 4
• Acinetobacter spp.	1 - 2
• Serratia spp.	<1
• Others	< 1 - 5

2. Draughtsman colonies are seen with:

a) Anthrax

b) Pnuemococci

c) Pertussis

d) Yersenia

Correct Answer - B

Pnuemococci

Due to alpha hemolysk, colonies of pneumococci rcsemble colonies of Str. virtdans. But on further incubation the colonies ofpneumococci become flat with raised edges and central umbonation, so that concentric rings are seen on the surface when viewed from above - draughtsman or Carrom coin appearance.

3. A 20 year old man presented with abdominal pain, vomiting and bloody diarrhea, his stool sample grew *Escherichia coli* in pure culture. Which of the following serotype of *E.coli* is the causative agent of hemorrhagic colitis?

a) O 157:H7

b) O 159:H7

c) O 107:H7

d) O 55:H7

Correct Answer - A

Enterohemorrhagic *E.coli* O157:H7 is the serotype of *E.coli* causing hemorrhagic colitis.

It is associated with the ingestion of undercooked hamburger, sprouts, unpasteurized milk or juice.

EHEC produces a shiga toxin and can cause colitis after an incubation period of 3 -5 days.

It typically produces watery diarrhea that progress to bloody diarrhea after a few hours to few days.

Fatigue, abdominal pain, nausea and vomiting are associated complaints.

Mechanism of enterohemorrhagic colitis appears to be vascular endothelial damage that leads to platelet aggregation and initiation of the coagulation cascade. This in turn, leads to ischemia of the

colon and results in hemorrhagic colitis.

Ref: Mayo Clinic Gastroenterology and Hepatology Board Review
By Stephen Hauser, 4th Edition, Page 197

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4. Granulomatosis infantiseptica is caused by:

- a) Pseudomonas
- b) Chlamydia trachomatis
- c) Group D streptococci
- d) Listeria

Correct Answer - D

Granulomatosis infantiseptica is an intra-uterine infection of the newborn caused by **listeria**.

The predominant feature of this condition is extensive focal necrosis affecting especially the liver and, less often, the lungs.

The mortality rate is very high.

Occasionally meningitis may be associated with it.

The organisms can be isolated from the affected areas in the child and frequently from the genital tract of the mother, who may or may not manifest the disease.

Ref: Harrison's principles of internal medicine, 18th edition, Page: 1196.

5. Stalactite growth in ghee broth is due to the following organism?

a) *Y.pestis*

b) *T.palladium*

c) *H.influenzae*

d) *C.diphtheriae*

Correct Answer - A

Cultural characteristics of *Yersinia pestis*:

1. When grown in a flask of broth with oil / ghee floated on top (ghee broth) a characteristic growth occurs which hangs down into the broth from the surface, resembling **stalactite**.
2. On **nutrient agar**, colonies are small, delicate, transparent discs, becoming opaque on continued incubation.
3. On **blood agar** colonies are dark brown due to absorption of the hemin pigment.
4. On **MacConkey agar** colourless colonies are formed.
5. In **broth** a flocculent growth occurs at the bottom and along the sides of the tube.

Ref: Textbook of Microbiology Ananthanarayanan, 8th edition

6. Milk ring test is done to detect which organism present in milk?

a) Bordetella

b) Brucellosis

c) Bartonella

d) Salmonella

Correct Answer - B

correct answer- B--> Brucellosis

- For the detection of Brucella in infected animals, pooled milk samples may be tested for bacilli by culture and for antibodies by several techniques.
- In the milk ring test, a sample of whole milk is mixed well with a drop of stained brucella antigen and incubated in a water bath at 70 degrees for 40-50 min.
- If antibodies are present in the milk, the bacilli are agglutinated and rise with the cream to form a blue ring at the top, leaving the milk unstained.
- If antibodies are absent, no colour ring is formed and the milk remains uniformly blue.

Also Know:

- Bordetella is detected using the cough plate method, post nasal swab, and the pernasal swab method.
- Bartonella bacilliformis causes Oroya fever.
- Bartonella quintana causes trench fever.
- Bartonella henselae causes cat scratch disease.
- Salmonella is detected using a widal reaction.

7. TRUE about corynebacterium diphtheriae are all, EXCEPT:

- a) Has metachromatic granules
- b) Does not invade deeper tissues
- c) Toxigenicity demonstrated by Elek's test
- d) Toxin mediated by chromosomal gene

Correct Answer - D

Corynebacteria are 0.5–1 μ m in diameter and several micrometers long.

Characteristically, they possess irregular swellings at one end that give them the "**club-shaped**" appearance.

Irregularly distributed within the rod (often near the poles) are granules staining deeply with aniline dyes (**metachromatic granules**) that give the rod a beaded appearance.

Diphtheria toxin is absorbed into the mucous membranes and causes destruction of epithelium and a superficial inflammatory response.

If disulfide bonds are broken, the molecule can be split into two fragments.

Fragment B (MW=38,000), which has no independent activity, is functionally divided into a receptor domain and a translocation domain.

Acidification of the translocation domain within a developing endosome leads to creation of a protein channel that facilitates movement of Fragment A into the host cell cytoplasm.

Toxin fragment A inactivates EF-2 by catalyzing a reaction that yields free nicotinamide plus an inactive adenosine diphosphate-

ribose-EF-2 complex (ADP-ribosylation).

It is assumed that the abrupt arrest of protein synthesis is responsible for the necrotizing and neurotoxic effects of diphtheria toxin.

The toxigenicity of the corynebacterium diphtheriae is demonstrated by Elek test.

Ref: Brooks G.F., Carroll K.C., Butel J.S., Morse S.A., Mietzneron T.A. (2010). Chapter 12. Aerobic Nonspore-Forming Gram-Positive Bacilli: Corynebacterium, Listeria, Erysipelothrix, Actinomycetes, & Related Pathogens. In G.F. Brooks, K.C. Carroll, J.S. Butel, S.A. Morse, T.A. Mietzneron (Eds), Jawetz, Melnick, & Adelberg's Medical Microbiology, 25e.

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8. Respiratory Syncytial Virus (RSV) causes all, EXCEPT:

a) Coryza in kids

b) ARDS

c) Bronchitis

d) Common cold

Correct Answer - B

RSV infection leads to a wide spectrum of respiratory illnesses. In infants it can cause pneumonia, bronchiolitis, and tracheobronchitis. In this age group, illness begins most frequently with rhinorrhea, low-grade fever, often accompanied by cough and wheezing.

In adults, the most common symptoms are common cold, with rhinorrhea, sore throat, and cough. It cause severe pneumonia in elderly.

Sinusitis, otitis media, and worsening of chronic obstructive and reactive airway disease are also associated with RSV infection.

Ref: Harrison's Principles of Internal Medicine, 18th Edition, Chapter 186

9. Who is the father of modern Microbiology?

a) Metchnikoff

b) Lord Lister

c) Louis Pasteur

d) Robert Koch

Correct Answer - C

Father of Modern Microbiology : Louis Pasteur.

Father of Medical Microbiology : Robert Koch.

Father of Pathology : Rudolph Virchow.

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10. Microorganism which causes pyogenic osteomyelitis is ?

- a) Streptococcus
- b) Staph aureus
- c) Corynebacterium
- d) Neisseria gonorrhoeae

Correct Answer - B

Staphylococcus aureus causes 80–90% of cases of acute pyogenic osteomyelitis. *S aureus* has a receptor for collagen, which contributes to its pathogenicity. Other organisms that cause osteomyelitis include:

- *Escherichia coli* and *Pseudomonas* in intravenous drug users and patients with urinary tract infections.
- *Haemophilus influenzae* and Group B *Streptococcus* in neonates.
- *Salmonella* in patients with sickle cell disease.

Ref: Wyatt C., Kemp W.L., Moos P.J., Burns D.K., Brown T.G. (2008). Chapter 19. Pathology of the Bones and Joints. In C. Wyatt, W.L. Kemp, P.J. Moos, D.K. Burns, T.G. Brown (Eds), *Pathology: The Big Picture*.

11. True statement about Pneumocystic Jiroveci is:

- a) Often associated with CMV infection
- b) Usually diagnosed by sputum examination
- c) Infection occurs only in immunocompromised patients
- d) Always associated with Pneumatocele

Correct Answer - B

Pneumocystis Jiroveci is usually diagnosed by sputum examination.

Ref: Medical Microbiology By Jawetz, 24th Edition, Pages 648-49;
Washington Manual of Pulmonary Medicine, 2006, Page 104;
Pneumocystis Pneumonia By Walzer, Cushion, 3rd Edition, Page
418; Harrison's Principles of Internal Medicine, 16th Edition, Pages
1194-95

12. Mycobacterium tuberculosis was discovered by ?

a) Louis pasteur

b) Robert koch

c) Lister

d) Jener

Correct Answer - B

Ans. is 'b' i.e., Robert koch

Scientist	Associated with
Fracastorius	Proposed a <i>contagium vivuim</i> (cause of infectious disease)
Von Plenciz	Suggested that each disease is caused by a separate agent
Augustino Bassi	Earliest discovery of pathogenic microorganism
Davaine and Pollender	Observed anthrax bacilli in blood of animal
Louis Pasteur	<i>Father of microbiology</i> (Also see above explanation)
Robert Koch	<i>Father of medical microbiology</i> <i>Discovered M. tuberculosis and V cholerae</i> Introduced staining techniques methods of obtaining bacteria in pure culture on solid media <i>Suggested Koch's postulate</i>
Joseph Lister	<i>Father of Aseptic surgery</i> Proved that sepsis could be prevented by

Antony Van Leeuwenhoek	Proved that sepsis could be prevented by Hand hygiene <i>Invented microscope (Father of compound microscope)</i> <i>Father of Bacteriology</i>
Edward Jenner	<i>Father of Immunology</i>
Peyton Rous	Isolated virus causing sarcoma in fowl
Von Behring & Kitasato	Described antibody

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13. Flagella not true -

a) Locomotion

b) Attachment

c) Protein in nature

d) Antigenic

Correct Answer - B
Ans. is 'b' i.e., Attachment

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14. Percentage of glutaraldehyde used ?

a) 1%

b) 2%

c) 3%

d) 4%

Correct Answer - B

Ans. is 'b' i.e., 2%

- 2% Glutaraldehyde (Cidex) is an aldehyde disinfectant with a broad spectrum of action against bacteria, fungi, viruses, as well as spores (slow action).

15. In nutrient agar concentration of agar is -

a) 1%

b) 1.5 %

c) 3%

d) 4%

Correct Answer - B

Ans. is 'b' i.e., 1.5%

- Nutrient Agar is a general-purpose, nutrient medium used for the cultivation of microbes supporting the growth of a wide range of non-fastidious organisms. Nutrient agar is popular because it can grow a variety of types of bacteria and fungi, and contains many nutrients needed for the bacterial growth.
- Nutrient agar is made by adding 1.5% agar to the nutrient broth.
- 0.5% Peptone
- 0.3% beef extract/yeast extract.
- 0.5% NaCl
- Distilled water
- pH is adjusted to neutral (7.4) at 25 °C.

16. Natural method of horizontal gene transfer among bacteria includes -

a) Electroporation

b) Transduction

c) Transformation

d) b and c

Correct Answer - D

Ans. is 'b' i.e., Transduction; 'c' i.e., Transformation

Gene transfer

- Gene transfer refers to the process of genetic material (e.g. DNA) being sent and received among two organisms ---> Donor sends and recipient receives the genetic material.
- There are two processes of gene transfer :?
 - 1) Horizontal gene transfer (HGT) or lateral gene transfer
- Horizontal gene transfer is the process by which genetic material is passed *between two different organism, i.e. organism of different species*.
- The recipient is not the offspring of donor.
- The most important example is *gene transfer between the bacteria*.
The processes of horizontal gene transfer in bacteria are :-
 1. Transduction
 2. Transformation
 3. Conjugation
- 2) Vertical gene transfer
- Vertical gene transfer is the process of transferring genetic material to organism of same species, i.e. donor receives genetic material from its ancestor, e.g. its parent or a species from which it evolved.
- Therefore, the donor will have the same general makeup as the

parents.

- Vertical gene transfer is "*a mix of two parents*", i.e. when two organisms mate, their genes are vertically transferred to their spawn.
- This process is *not important in bacteria*.

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17. Which cells cause rosette formation with sheep RBCs-

a) T cells

b) NK cells

c) Monocytes

d) All

Correct Answer - A
Ans. is 'a. T cells

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18. Gene components of HLA class I includes

-

a) A, B, C

b) DR

c) DQ

d) DP

Correct Answer - A

Ans. is 'a' i.e., A, B, C

. Class I HLA comprises A, B and C loci.

19. Complement attaches to immunoglobulin at ?

a) Aminoterminal

b) Fab region

c) Variable region

d) Fc fragment

Correct Answer - D

Ans. is 'd' i.e., Fc fragment

. Fc fragment is composed of the carboxyterminal. It determines the biological activity such as complement fixation, placental transfer, skin fixation and catabolic rate.

- CH-2 of Ig G and C_H, of IgM bind to C₁q portion of C1.

20. Antigen idiootype is related to -

a) Fc fragment

b) Hinge region

c) C-terminal

d) N-terminal

Correct Answer - D

Ans. is 'd' i.e., N-terminal

- The idiootype is the specific region of the fab portion (not Fc fragment) of Ig molecule to which antigen binds.
- Idiootype (antigen binding site) is on variable region, which is at amino terminal (N-terminal).
- The aminoacid sequences of the variable regions are not uniformly variable along their length, but consist of relatively invariable and some highly variable zones.
- The highly variable zones are involved with the formation of antigen binding sites.
- The sites on the hypervariable regions that make actual contact with the epitopes are called "complementarity determining Regions."

21. Idiotypic class of antibody is determined by -

a) Fc region

b) Hinge region

c) Carboxy end

d) Amino end

Correct Answer - D

Ans. is 'd' i.e., Amino end

- The idotype is defined as the specific region of the *Fab portion* of the Ig molecule to which antigen binds.
- It is on aminoterminal where antigen binding site is present.

22. Antibody diversity is due to -

a) Gene rearrangement

b) Gene translocation

c) Antigenic variation

d) a and c

Correct Answer - D

Ans. is 'a' i.e., Gene rearrangement; 'c' i.e., Antigenic variation

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23. Immunoglobulin changes in variable region ?

a) Idiotype

b) Isotype

c) Allotype

d) Epitope

Correct Answer - A
Ans. is 'a' i.e., Idiotype

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24. Pentavalent immunoglobulin is

a) IgA

b) IgG

c) IgM

d) IgE

Correct Answer - C
Ans. is 'c' i.e., IgM

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25. Maximum half life -

a) IgG

b) Ig A

c) IgM

d) Ig E

Correct Answer - A
Ans. is 'a' i.e., IgG

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26. Which of the following immunoglobulin is responsible for opsonisation -

a) IgA

b) Ig G

c) Ig M

d) none

Correct Answer - C

Ans. is 'c' i.e., IgM > 'b' i.e., IgG

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27. Activation of classical complement pathway ?

a) IgA

b) IgG

c) IgM

d) IgD

Correct Answer - C
Ans. is 'c' i.e., IgM

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28. The Fc piece of which immunoglobulin fixes C1

a) IgA

b) IgG

c) IgM

d) c and b

Correct Answer - D

Ans. is 'c' > 'b' i.e., IgM > IgG

- Make it very clear in your mind that both IgM and IgG fix C 1.
" C2 of IgG and C₁₁4 of IgM bind to C1q portion of C1"-----

Ananthanarayan

"C1q portion of C1 is an aggregate of 18 polypeptides that binds to the Fc portion of IgM and IgG."---LANGE microbiology

- However, if you will have to choose one option, IgM is the best because IgM is more effective than IgG for complement fixation.

29. Antibody elevated in parasitic infection ?

a) IgA

b) IgE

c) IgG

d) IgM

Correct Answer - B
Ans. is 'b' i.e., **IgE**

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30. Papain acts on gamma globulin to form ?

a) 2 Fc fragments

b) 2 Fab fragments

c) 1 Fab fragments

d) None

Correct Answer - B

Ans. is 'b' i.e., 2 Fab fragments

. Papain acts at hinge region to produce :?

1) *One Fc fragments*

2) *Two Fab fragments*

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31. Which of the following T cell independent Antigen acts through -

a) T-cell

b) B-cell

c) Macrophages

d) CD8+ T cells

Correct Answer - B

Ans. is 'b' i.e., B-cells

- T-cell independent antigens directly stimulates B-cells without processing by antigen presenting cells.

32.

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Which part of bacteria is most antigenic ?

a) Protein coat

b) Lipopolysaccharide

c) Nucleic acid

d) Lipids

Correct Answer - A

Ans. is d i.e., Lipids

- Proteins are most immunogenic, while lipids & nucleic acids are least immunogenic.
- Polysaccharides (carbohydrates) are *less immunogenic* than protein antigens, but are *more antigenic* than lipids & nucleic acids.

33. Superantigen causes -

a) Polyclonal activation of T-cells

b) Stimulation of B cells

c) Enhancement of phagocytosis

d) Activation of complement

Correct Answer - A

Ans. is 'a' i.e., Polyclonal activation of T-cells

- *Superantigens are capable of activating up to 20% of the peripheral T-cell pool, where as conventional antigens activate < 1 in 10, 000.*

34. Prozone phenomenon is seen with?

- a) Same concentration of antibody and antigen
- b) In antigen excess to antibody
- c) Antibody excess to antigen
- d) Hyperimmune reaction

Correct Answer - C

. Ans. is 'c' i.e., Antibody excess to antigen

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35. Paul bunnel reaction is a type of

a) Agglutination

b) CF

c) Precipitation

d) Flocculation test

Correct Answer - A

Ans. is 'a' i.e., Agglutination test

- Paul Bunnell test is tube agglutination test.

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36. All are true about innate immunity except ?

a) Non-specific

b) First line of defence

c) Not affected by genetic affected

d) Includes complement

Correct Answer - C

Ans. is 'c' i.e., Not affected by genetic affected

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37. When transfer factor is given as treatment results in -

a) Natural active immunity

b) Artificial active immunity

c) Artificial passive immunity

d) Adoptive immunity

Correct Answer - D

Ans. is 'd' i.e., Adoptive immunity

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38. Which is found in DiGeorge's syndrome -

a) Tetany

b) Eczema

c) Total absence of T cells

d) Absent B and T cells

Correct Answer - A

Ans. is 'a' i.e., Tetany

DiGeorge syndrome

- DiGeorge syndrome is an example of a T cell deficiency that results from failure of development of the third and fourth pharyngeal pouches.
 - * Clinical features?
 - * Enhanced susceptibility to viral, fungal (*mucocutaneous candidiasis*) and bacterial infections.
 - * Facial abnormalities : Hypertelorism, abnormal ears, short philtrum and micrognathia.
- Hypocalcemic tetany* due to failure of parathyroid development.
Congenital heart diseases eg fallot's tetralogy.
- * Absence of a normal thymus.
 - * Serum immunoglobulin concentration are frequently normal, but antibody responses, particularly of IgG and IgA isotypes, are usually impaired.
 - * *T cell levels are reduced (not total absence).*
 - * *B cell levels are normal.*

39. Complement formed in liver -

a) C2, C4

b) C3, C6, C9

c) C5, C8

d) C1

Correct Answer - B

Ans. is b' i.e., C3, C6, C9

Biosynthesis of complement components

. Complement components are synthesized in various sites of body :-

- | | | |
|------|--------------------|----------------|
| i) | <i>Intestine</i> | —> C1 |
| ii) | <i>Macrophages</i> | —> C2, C4 |
| iii) | <i>Spleen</i> | —> C5, C8 |
| iv) | <i>Liver</i> | --> C3, C6, C9 |

40. Center of complement pathway -

a) C3

b) C1

c) C5

d) C2

Correct Answer - A

Ans. is 'a' i.e., C3

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41. Hereditary angioneurotic edema is due to ?

a) Deficiency of C1 inhibitor

b) Deficiency of NADPH oxidase

c) Deficiency of MPO

d) Deficiency of properdin

Correct Answer - A

Ans. is 'a' i.e., Deficiency of C₁ inhibitor

- Hereditary angioneurotic edema is due to C₁ inhibitor (C_i esterase inhibitor) deficiency.

42. Opsonization takes place through -

a) C3a

b) C3b

c) C5a

d) C5b

Correct Answer - B
Ans. is 'b' i.e., C3b

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43. Rosette formation with sheep RBC's indicate functioning of -

a) T-cells

b) B-cells

c) Neutrophils

d) Monocytes

Correct Answer - A

Ans. is 'a' i.e., T-cells

T cells bind to sheep erythrocytes forming rosettes (SRBC or E rosette) by CD2 antigen.

44. Digeorge syndrome is characterized by all except ?

- a) Congenital thymic hypoplasia
- b) Abnormal development of third and fourth pouches
- c) Hypothyroidism
- d) Hypocalcemic tetany

Correct Answer - C
Ans. is 'c' i.e., Hypothyroidism

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45. Staph aureus causes -

a) Erythrasma

b) Chancroid

c) Acne vulgaris

d) Bullous impetigo

Correct Answer - D

Ans. is 'd' i.e., Bullous impetigo

- Impetigo is divided into two types :?

i) *Non-bullous impetigo (Impetigo contagiosum)* :- Caused by staphylococcus aureus and streptococcus pyogenes.

ii) *Bullous impetigo* :- Caused by staphylococcus aureus.

46. Glomerulonephritis in streptococcal infection is diagnosed by -

a) Blood culture

b) Throat culture

c) ASO Titre

d) PCR

Correct Answer - C

Ans. is 'c' i.e., ASO Titre

- In rheumatic fever and glomerulonephritis, retrospective diagnosis of streptococcal infection may be established by demonstrating high levels of antibodies to streptococcal toxins.
- The usual test done is antistreptolysin O titration.
- ASO titres higher than 200 units are considered significant and suggests either recent or recurrent infection with streptococci.
- ASO titres > 200 units do not mean rheumatic fever, it only indicates recent or recurrent infection.

47. Which group of streptococcus grow at > 60°C

a) A

b) B

c) C

d) D

Correct Answer - D

Ans. is 'd' i.e., **D**

Among streptococci, enterococcus (group D streptococcus) is heat resistant.

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48. Pneumococcal vaccine is prepared from ?

- a) Cell surface antigen
- b) Capsular polysaccharide
- c) From exotoxin
- d) From M protein

Correct Answer - B

Ans. is 'b' i.e., Capsular polysaccharide

There are two types of pneumococcal vaccines available : -

1. Polyvalent (23 types) polysaccharide vaccine

- This polysaccharide vaccine represents the capsular antigen of 23 most prevalent serotypes.
- It gives 80-90 % protection which is long-lasting (5 years).
- It is not meant for general use, but only in persons at enhanced risk of pneumococcal infection such as those with absent or dysfunctional spleen; sickle cell disease, coeliac disease; Chronic liver or renal or lung or cardiac disease, DM, CSF leaks (meningeal disruption: dural tear) and; immunodeficiency including HIV infection.
- It is not recommended in children under two years of age and those with lymphoreticular malignancies and immunosuppressive therapy.

2. Conjugate Vaccine

- A different pneumococcal vaccine containing pneumococcal polysaccharide coupled (conjugated) to a carrier protein (diphtheria toxoid) has been developed.
- The vaccine contains the capsular polysaccharide of seven most common pneumococcal serotypes,
- It can be given to children under the age of 2 years (but more than 6 weeks old).

49. Meningococci differ from gonococci in that they?

a) Are intra-cellular

b) Possess a capsule

c) Cause fermentation of glucose

d) Are oxidase positive

Correct Answer - B

Ans. is 'b' i.e., Possess a capsule

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50. Virulence of gonococci is due to -

a) Pili

b) Endotoxin

c) Exotoxin

d) None

Correct Answer - A

Ans. is 'a' i.e., Pili

. Major virulence factor for gonococci is pill
(fimbriae).

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51. Meningitis with rash is seen in -

a) Neisseria meningitidis

b) H. influenzae

c) Strepto. agalactae

d) Pneumococcus

Correct Answer - A

Ans. is 'a' i.e., Neisseria meningitidis

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52. The vaccine against N-meningitidis contains ?

- a) Whole bacteria
- b) Capsular polysaccharide
- c) Somatic 'O' antigen
- d) None of these

Correct Answer - B

Ans. is 'b' i.e., Capsular polysaccharide
Meningococcal vaccine

- **Meningococcal vaccine** refers to any of the vaccines used to prevent infection by *Neisseria meningitidis*.
- Different versions are effective against some or all of the following types of meningococcus: A, B, C, W-135, and Y
- Effective vaccines prepared from purified Group A, Group C, Group Y, and or Group W - 135 meningococcal capsular polysaccharides. The immunity is group-specific.
- Meningococcal vaccines containing unconjugated purified capsular polysaccharides (A, C, Y and W) have been available since the 1970s and are still used to immunise travellers and at-risk individuals.
- Vaccines can be formulated as bivalent (groups A and C) or tetravalent (groups A, C, Y, and W135).
- The vaccines induce good immunity after a single dose in older children and adults but are of a little value in children below 3 years.
- It takes 10-14 days for immunity to develop.
- There is no Group B vaccine available at present.

53. Daisy head colonies are seen with -

- a) Staph. Aureus
- b) Corynebacterium diphtheriae
- c) Staph. Pyogenes
- d) Anthrax

Correct Answer - B

Ans. is 'b' i.e., Corynebacterium Diphtheriae

- Four subspecies are recognized: *C. d. mitis*, *C. d. intermedius*, *C. d. gravis*, and *C. d. belfanti*.
- C.d.Gravis Colony on Tellurite Blood Agar is having $\geq 2\text{mm}$, dull greyish black, opaque colonies, daisy head, brittle, like cold margarine.
- Special stains like Albert's stain and Ponder's stain are used to demonstrate the metachromatic granules formed in the polar regions. The granules are called polar granules, Babes Ernst granules, volutin etc
- **daisy-head colony**. a round grey or black **colony** with a narrow translucent scalloped border, typically produced by Corynebacterium diphtheriae on tellurite blood agar.

54. The "String of pearl" colonies on Nutrient agar is produced by -

a) Klebsiella

b) Proteus

c) Bacillus

d) Salmonella

Correct Answer - C

Ans. is 'c' i.e., Bacillus

String of pearl reaction

- String of pearl reaction is used to differentiate *B. anthracis* from *B. cereus* and other aerobic spore-forming bacteria.
- When *B. anthracis* is grown on a solid medium containing penicillin, the cells become larger, spherical and occur in chains on the surface of the agar, resembling a string of pearls.

55. Saccharolytic species of clostridia ?

a) C. tetani

b) Cl. cochlearum

c) Cl. septicum

d) None

Correct Answer - C

Ans. is 'c' i.e., Cl. septicum

- Clostridia may break down carbohydrate for energy (saccharolytic) or break down protein for energy (Proteolytic) or both. Different clostridia have a different pattern:-
 - A) Both proteolytic and saccharolytic
- Pre-dominating proteolytic- **Cl. sporogenes, Cl. botulinum A.B.F., Cl. bifermentans, Cl. histolyticum.**
- Pre-Dominating Saccharolytic - **Cl. perfringens, Cl. novyi, Cl. septicum, Cl. difficile.**
 - B) Only proteolytic (not saccharolytic) - **Cl. tetani**
 - C) Only Saccharolytic (not proteolytic) - **Cl. botulinum C.D.E.**
 - D) Neither proteolytic nor saccharolytic - **Cl. cochlear**

56. The following statements are true regarding botulism except -

- a) Infant botulism is caused by ingestion of preformed toxin
- b) Clostridium botulinum A, B, C and F cause human disease
- c) The gene for botulinum toxin is encoded by a bacteriophage
- d) Clostridium baratti may cause botulism

Correct Answer - A

Ans. is 'a' i.e., Infant botulism is caused by ingestion of preformed toxin

Infant botulism is caused by ingestion of spores. Spores are ingested in food, get established in the gut and there produce the toxin.

"Seven main types of *C. botulinum*, designated A - G, produce antigenically distinct toxins with pharmacologically identical action. All types can cause human disease, but type A, B and E are most common".

(In Harrison & Ananthanarayan, eight types of *C. botulinum* A, B, C₁, C₂, D, E, F, G have been mentioned).

Toxin production in clostridium botulinum appears to be determined by presence of bacteriophage (at least in type C & D).

"Clostridium butyricum and clostridium baratti have also been found to produce toxin". - Harrison 16th/e 843 - Any strain producing toxin will obviously cause botulism.

57. Botulism is most commonly due to -

a) Egg

b) Milk

c) Meat

d) Pulses

Correct Answer - C

Ans. is 'c' i.e., Meat

Following new types of botulism have been added in 18th/e of Harrison

- . *Adult intestinal toxemia botulism* :- results from absorption of toxin produced in situ after rarely occurring intestinal colonization with toxigenic clostridia.

- . *Iatrogenic botulism* :- results from injection of botulism toxin.

58. Pseudomembranous colitis, all are true except -

- a) Toxin A is responsible for clinical manifestation
- b) Toxin B is responsible for clinical manifestation
- c) Blood in stools is a common feature
- d) Summit lesions is early histopathological finding

Correct Answer - C

Ans. is 'c' i.e., Blood in stools is a common feature

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59. Shigella are be divided into subgroup on the basis of ability to ferment -

a) Lactose

b) Maltose

c) Fructose

d) Mannitol

Correct Answer - D

Ans. is 'd' i.e., Mannitol

Fermentation of mannitol is of importance in classification

Shigella

Mannitol fermenting

Sh. flexneri (sub group B)
group A)

Sh boydii (sub group C)

Sh. Sonnei (sub group D)

Mannitol nonfermenting

Sh. dysenteriae (sub

60. Which of the following stimulate adenylate cyclase with G-protein coupled action ?

a) Shiga toxin

b) Cholera toxin

c) Diphtheria toxin

d) Pseudomonas toxin

Correct Answer - B

Ans. is 'b' i.e., Cholera toxin

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61. Cholera toxin is due to -

a) Chromosome

b) Plasmid

c) Phage

d) Transposons

Correct Answer - C

Ans. is 'c' i.e., Phage

. Cholera toxin production is determined by a *filamentous phage* integrated with bacterial chromosome.

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62. Pseudomonas is which type of bacteria ?

a) Anaerobic

b) Microaerophilic

c) Microaerophilic

d) Obligate anaerobe

Correct Answer - C

Ans. is 'c' i.e., Microaerophilic

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63. What is NOT true about yersiniosis -

- a) *Gram-negative bacillus*
- b) Caused by *Y. pestis*
- c) By *Yersinia enterocolitica*
- d) By *Yersinia pseudotuberculosis*

Correct Answer - B

Ans. is 'b' i.e., Caused by *Yersinia pestis*

Yersiniosis is an infectious disease caused by a bacterium of the genus *Yersinia*.

Yersinia enterocolitica is a Gram-negative bacillus-shaped bacterium, belonging to the family Yersiniaceae. It is motile at temperatures of 22–29° C (72–84°F), but becomes nonmotile at normal human body temperature.^{[1][2]} *Y.*

enterocolitica infection causes the disease yersiniosis, which is an animal-borne disease occurring in humans, as well as in a wide array of animals such as cattle, deer, pigs, and birds.

- Infection caused by *Yersinia* genus are divided into :-
 - i) **Plague** :- It is a deadly infectious disease caused by *Yersinia pestis*.
 - ii) **Yersiniosis** :- It is characterized by infectious diarrhea, enteritis, ileitis and occasionally septicemia. It is caused by *Yersinia enterocolitica* (most common) and *Yersinia pseudotuberculosis*.

64. True about H influenza -

a) Grown on sheep blood agar & CO₂

b) it is not capsulated

c) Invasive strain is most common

d) Gram positive

Correct Answer - C

Ans. is 'c' i.e., Invasive strain is most common

- Invasive disease is more common than non-invasive disease.
- H. influenzae does not grow on blood agar.
- It is gram negative and capsulated.

65. Thumb print appearance in culture film smear is seen -

a) *Bacillus anthracis*

b) *Brucella*, species

c) *Bordetella pertussis*

d) *Clostridium Welchii*

Correct Answer - C

Ans. is 'c' i.e., *Bordetella pertussis*

- In culture smears, the bacilli are arranged in loose clumps with clear spaces in between giving a thumbprint appearance.

Culture Characteristics of *Bordetella*

- Incorporation of diamine fluoride and penicillin (Lacey's DFP medium) makes it more selective.
- It produces bisected pearl or mercury drops colonies.
- Confluent growth is present with "aluminium paint" appearance.
- In culture smears the bacilli are arranged in loose clumps with clear spaces in between giving a thumbprint appearance.
- Transport media used are modified by Stuart's medium and Mischulo's charcoal agar.

66. Tuberculin test is positive if induration is ?

a) >2min

b) >5mm

c) >7mm

d) >10mm

Correct Answer - D

Ans. is 'd' i.e., > 10mm

- The tuberculosis skin test is another name for the tuberculin test or PPD test.
- The PPD test determines if someone has developed an immune response to the bacterium that causes tuberculosis (TB)
- A **tuberculin** reaction is classified as **positive** based on the diameter **of** the **induration** in conjunction with certain patient-specific risk factors.
- In a healthy person whose immune system is normal, **induration** greater than or equal to 15 mm is considered a **positive** skin test.

Procedure

- The standard recommended tuberculin test is the Mantoux test, which is administered by injecting a 0.1 mL of liquid containing 5 TU (tuberculin units) PPD (purified protein derivative) into the top layers of skin of the forearm.
- Doctors should read skin tests 48-72 hours after the injection.
- The basis of the reading of the skin test is the presence or absence and the amount of induration (localized swelling).
- A negative test does not always mean that a person is free of tuberculosis.

- A person who received a BCG vaccine (administered in some countries but not the U.S.) against tuberculosis may also have a positive skin reaction to the TB test.

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67. Pigment producing atypical mycobacteria ?

a) *M. fortution* and *M. chelonae*

b) *M. xenopi* and MAC

c) *M. gordonae* and *M. szulgai*

d) *M. ulcerans*

Correct Answer - C

Ans. is 'c' i.e., *M. gordonae* and *M. szulgai*

- Non-tubercular mycobacteria (also called atypical mycobacteria) have been classified into four groups by Runyon based on pigment production and rate of growth.
 - 1) Group I (photochromogens) :- These produce pigmented colonies (yellow-orange) only when exposed to light, but not in dark. Examples of photochromogens are *M. asiaticum*, *M. kansasii*, *M. marinum*, and *M. simiae*.
 - 2) Group II (scotochromogens) :- These always produce pigmented colonies (yellow-orange-red), i.e. in dark as well as in light. Scotochromogens are *M. flovescens*, *M. gordonae*, *M. scrofulaceum* and *M. szulgi*.
 - 3) Group III (Nonchromogens) :- These do not produce pigment. Nonchromogens are *M. avium complex (MAC)*, *M. haemophilum*, *M. gastri*, *M. ulcerans*, *M. xenopi* and *M. nonchromogenicum*.
 - 4) Group IV (rapid growers) :- This is heterogeneous group of mycobacteria capable of rapid growth, colonies appearing within 7 days of incubation. Within the group, photochromogenic, scotochromogenic and nonchromogenic species occur. *Chromogenic (pigment producing)* rapid growers are mostly saprophytic, e.g. *M. phlei* and *M. smegmetis*. *M. fortuitum* and *M.*

chelonei do not produce any pigment. Other rapid growers are *M. abscessus*, *M. vaccae*, *M. genevense*, *M. confluentis*, and *M. intermedium*.

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68. Fish tank granuloma is seen in -

a) M fortuitum

b) M kansasii

c) M marinum

d) M leprosy

Correct Answer - C

Ans. is 'c' i.e., M. Marinum

- 'Fish tank granuloma', also called swimming pool granuloma, is caused by M. marinum.

69. Tabes dorsalis is seen in -

a) Primary syphilis

b) Secondary syphilis

c) Tertiary syphilis

d) Latent syphilis

Correct Answer - C

Ans. is 'c' i.e., Tertiary syphilis

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70. True about VDRL test -

a) Non - specific

b) Slide flocculation test

c) Best followed for drug therapy

d) All

Correct Answer - D

Ans is 'd' i.e., All

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71. TRUE about mycoplasma is -

- a) Causes lung infection
- b) Penicillin is drug of choice
- c) Thick cell wall
- d) Thallium acetate inhibits the growth

Correct Answer - A

Ans. is 'a' i.e., Causes lung infection

Mycoplasma infections

- . *Mycoplasma pneumoniae* causes infection of upper and lower respiratory tract.
- . Highest attack rates in 5 - 20 years old.
- . Children < 5 yrs Upper respiratory symptoms
- . Children > 5 yrs —0. Bronchitis and pneumonia
- . disease. About other options
- . Penicillin is not active against mycoplasmas.
- . Mycoplasmas lack cell wall.

Mycoplasmas are resistant to thallium acetate in a concentration of 1:10000

72. Seven sheathed flagella is seen in -

a) V cholera

b) H pylori

c) Ps aeruginosa

d) Spirochetes

Correct Answer - B

Ans. is 'b' i.e., H. pylori

- H. pylori has five to seven sheathed polar flagella.
 - Vibrio cholerae and Pseudomonas aeruginosa have single polar flagellum. Occasional strains of pseudomonas may contain 2 or 3 flagella.
- Spirochetes (Treponema) is motile by endoflagella.

73. Legionnaire disease is caused by?

- a) Motile gram positive
- b) Motile gram negative
- c) Non-motile gram positive
- d) Non-motile gram negative

Correct Answer - B

Ans. is 'b' i.e., Motile gram-negative

- Legionella is a gram-negative, non-capsulated coccobacillus which is motile by polar or subpolar Flagella.

Legionella causes the following infections :

A) Pulmonary infections

There are two types of pulmonary infections:-

1. Pontiac Fever: It is self-limiting flu-like illness with incubation period 24-48 hours. There is no pneumonia.
2. Legionnaires Disease:
 - It is atypical pneumonia with an incubation period of 2-10 days.
 - It is characterized by cough, chest pain, hemoptysis, high-grade fever, diarrhoea, confusion, 'relative bradycardia and hyponatremia'.
 - If the onset of symptoms occurs within 10 days of discharge from the hospital, nosocomial legionnaire's disease should be suspected.

Extrapulmonary infections

- The most common site of infection is the heart (myocarditis/pericarditis/endocarditis).

74. Patient came from Nagaland and shows positive test with OXK antigen. Diagnosis is?

a) Trench fever

b) Scrub typhus

c) Endemic typhus

d) Epidemic typhus

Correct Answer - B

Ans. is 'b' i.e., Scrub typhus

Weil Felix reaction (Detect OXK antibodies)

. This reaction is an agglutination test in which sera are tested for agglutinins to O antigens of certain non-motile proteus strains OX - 19, OX - 2 and OX - K.

- The basis of the test is the sharing of an alkali - stable carbohydrate antigen by some rickettsiae and by certain strains of proteus, *P. vulgaris* OX - 19 and OX - 2 and *P. mirabilis* OX - K.
- The test is usually done as a tube agglutination, though rapid slide agglutination methods have been employed for screening.

Weil Felix Reaction

Disease	OX-19	OX-2	OX-K
Rocky Mountain spotted fever	+	+	?
Rickettsial pox	-	-	?
Epidemic typhus	+	-	-
Brill - Zinsser disease	+/-	-	?

Scrub typhus	-	-	+
Endemic typhus	+	-	?
Trench fever		-	?
Q fever		-	

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75. All are true about B. Quintana except -

- a) Causes trench fever
- b) Not detected by weil felix reaction
- c) Recurrence is common
- d) Tick is the vector

Correct Answer - D

Ans. is 'd' i.e., Tick is the vector

Trench fever

- Trench fever, also called *5-day fever* or *quintan fever*, is caused by *Bartonella quintana* (*Rochalimaea quintana*).
- The *human body louse* (*Pediculus humans corporis*) is the vector and humans is the only known reservoir. Clinical manifestations
- The incubation period is 15-25 days (range, 3-38 days).
- 'Classical' trench fever presents as febrile illness. Fever is exceedingly variable, but commonly *lasts for about 5 days*. The fever is followed by a remission and a *recurrence after 5 days*. *These recurrences may be single or multiple and upto 12 recurrences every 5-6 days are not uncommon*.
- Other symptoms and signs include headache, back and limb pain, profuse sweating, shivering, myalgia, arthralgia, splenomegaly, a maculopapular rash in occasional cases, and nuchal rigidity in some cases.

Diagnosis

- Definitive diagnosis requires isolation of *B. quintana* by blood culture.
- *Weil-Felix test used for diagnosis of rickettsial infection is negative in trench fever*.

Treatment

- It is treated with gentamycin along with doxycycline.

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76. Boutonneuse fever is caused by -

a) Rickettsia japonica

b) Rickettsia conorii

c) Rickettsia sibirica

d) Rickettsia australis

Correct Answer - B

Ans. is 'b' i.e., Rickettsia conorii

Tick borne fevers caused by Rickettsia

Organism	Fever caused
R. conorii	<i>Mediterranean spotted fever (boutonneuse fever)</i> Kenya tick typhus <i>Indian tick typhus</i> South African tick typhus Israeli spotted fever Astrakhan spotted fever
R. rickettsii	Rocky mountain spotted fever
R. Afircae	African tick-bite fever (A similar disease is caused by R. parker in US and A. trisite in South America)
R. japonica	Japanese spotted fever (oriental spotted fever) (similar disease in North Asia is caused by R. sibirica and R. heilongjiangensis)
R. honei	Flinders Island spotted fever
R. australis	Queensland tick typhus

77. Which of the following has only 1 serotype -

a) *C. psittaci*

b) *C. pneumoniae*

c) *C. trachomatis*

d) None

Correct Answer - B

Ans. is 'b' i.e., *C. pneumoniae*

There are many serovars of chlamydiae :

C. trachomatis TRIC —p. 12 serotypes } Total 15

C. trachomatis LGV 3 serotypes

C. psittaci — Many serotypes

C. pneumoniae —10. Only one serotype

78. Which of the following is called as Preisz-Nocard bacillus -

a) *C. diphtheriae*

b) *C. pseudotuberculosis*

c) *M. tuberculosis*

d) *Mycoplasma*

Correct Answer - B

Ans. is 'b' i.e., *C. pseudotuberculosis*

Bacteria and their alternate names

- | | |
|---|-------------------------------------|
| • <i>Bordetella</i> | • <i>Bordet Gengou bacillus</i> |
| • <i>Clostridium tetani</i> | • <i>Nicolaire's bacillus</i> |
| • <i>Corynebacterium diphtheriae</i> | • <i>Klebs-Loeffler 's bacillus</i> |
| • <i>Corynebacterium pseudotuberculosis</i> | • <i>Preiszi-Nocard bacillus</i> |
| • <i>Haemophilus aegyptius</i> | • <i>Koch-Weeks bacillus</i> |
| • <i>Haemophilus influenzae</i> | • <i>Pfeiffer 's bacillus</i> |
| • <i>Klebsiella pneumoniae</i> | • <i>Friedlander's bacillus</i> |
| • <i>Klebsiella ozaenae</i> | • <i>Abel's bacillus</i> |
| • <i>Klebsiella Rhinoscleromatis</i> | • <i>Frisch 's bacillus</i> |
| • <i>Mycobacterium tuberculosis</i> | • <i>Koch's bacillus</i> |
| • <i>Mycobacterium intracellulare</i> | • <i>Bathey's bacillus</i> |
| • <i>Mycobacterium paratuberculosis</i> | • <i>Johne's bacillus</i> |
| • <i>Mycoplasma</i> | • <i>Eaton agent</i> |
| • <i>Pseudomonas pseudomallei</i> | • <i>Whitmore's bacillus</i> |

79. All cause fournier gangrene except-

a) Staphylococcus

b) Streptococcus

c) Clostridium

d) Bacteroides

Correct Answer - C

Ans. is 'c' i.e., Clostridium

- Fournier's gangrene is a necrotising fascitis of genitalia, usually affecting the scrotum and penis.
- There have been many types of bacteriological culture encountered in Fournier's gangrene, both single strain and polymicrobial culture. *Majority of cases are due to mixed infection caused by both aerobic and anaerobic bacteria.*
- Following are common causative organisms : *Staphylococcus aureus*, *streptococcus pyogenes* ((3-hemolytic streptococci), enterobacteriaceae (E. coli, klebsiella, proteus), enterococci, pseudomonas, and anaerobes like *bacteroides* and peptostreptococcus.

80. Necrotizing fascitis is caused by -

a) Staphylococcus aureus

b) Beta hemolytic streptococci

c) Clostridium perfringens

d) Pneumococcus

Correct Answer - B

Ans. is 'b' i.e., Beta hemolytic streptococci

- The spectrum of infections of the *deep soft tissues* ranges from localized bacterial, viral and parasitic lesions to rapidly spreading, tissue destructive infections such as necrotizing fascitis and myonecrosis.

A) Pyomyositis :- It is common in tropics, therefore also called *tropical pyomyositis*. It is a localized infection of skeletal muscles. It is caused most commonly by *staphylococcus aureus*.

B) Necrotizing fascitis Necrotizing fascitis is an infection of the deeper layers of skin and subcutaneous tissues, easily spreading across the fascial plane within the subcutaneous tissues. There are two types of necrotizing fascitis :?

i) *Type 1*:- It is a polymicrobial infection, i.e. mixed aerobic and anaerobic infection. It occurs most commonly after surgical procedures in diabetic patients or in those who have peripheral vascular disease.

ii) *Type 2* :- It is caused most commonly by *streptococcus pyogenes* (Group A beta hemolytic streptococci).

C) Clostridial myonecrosis (Gas gangrene) :- It is characterized by rapid and extensive necrosis of muscle accompanied by gas formation and systemic toxicity. It is caused by *C. perfringens* (most common), *C. novyi*, *C. septicum* and *C. histolyticum*. It is also called

type III necrotizing fascitis.

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81. Which of the following organisms does not enter through abrasions in the skin -

a) *E. rhusiopathiae*

b) *E. corrodens*

c) *C. hominis*

d) *C. violaceum*

Correct Answer - C

Ans. is 'c' i.e., *C. hominis*

Bacteria circulate and multiply in blood --->

. Bacteria circulate in blood	-->	Septicemia
. Toxins circulate in blood	-->	Bacteremia
. Pus in blood	—>	Toxemia
		Pyemia

- *Eikenella corrodens* (*E. corrodens*), *chromobacterium violaceum* (*C. violaceum*) and *Eikenella corrodens* (*E. corrodens*) enters the body through skin abrasions.
- A wide variety of microorganisms that reside on the skin and mucous membranes of the body, as well as those found in the environment, can cause skin and soft tissue infections.
- These organisms enter the body through breaks in the skin or mucous membranes, through wounds made by trauma or bites or as a complication of surgery or foreign-body implantation.

These organisms have been mentioned in following table :

Aerobic and facultative microorganisms	Anaerobic bacteria	Aerobic microorganisms from unusual, Vs specialized and zoonotic infections	Yeast
• Coagulase	•	Actinobacillus	• Cand

negative	Peptostreptococcus •	albicans
staphylococci spp.	actinomycetemcomitans	• Canc krusei
•		• Canc parapsil
Staphylococcus aureus	• Clostridium spp.	• Aeromonas spp.
• Enterococcus spp.	• Eubacterium limosum	• Bacillus anthracis
•	• Bacteroides fragilis	Bergeyella zoohelcum
Streptococcus viridans		•
•		<i>Chromobacterium violaceum</i>
Corynebacterium spp.	• Prevotella spp.	•
• Bacillus cereus	• Porphyromonas	• <i>Eikenella corrodens</i>
• E. coli	• Fusobacterium	• <i>Erysipelothrix rhusiopathiae</i>
• Serratia	• Veillonella spp.	• Francisella tularensis
• Enterobacter		• Haemophilus spp.
• Proteus		• Kingella kingae
• Morganella		
•		• Pasteurella multocida
Pseudomonas		• Streptobacillus moniliformis
• Acinetobacter		• Vibrio vulnificus

82. Darting motility which occur in *V.cholerae*, also found in -

a) *Shigella*

b) *Campylobacter jejuni*

c) *Pneumococcus*

d) *Bacillus anthrax*

Correct Answer - B

Ans. is 'b' i.e., *Campylobacter jejuni*

Darting (shooting star) motility is seen in

- *V. Cholerae*
- *Gardnerella vaginalis*
- *Campylobactor*

83. All are true about cutaneous anthrax except ?

- a) Extremely painful
- b) The whole area is congested and edematous
- c) Central crustation with black eschar
- d) Satellite nodule around inguinal region

Correct Answer - A

Ans. is 'a' i.e., Extremely painful

Cutaneous anthrax is painless.

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84. True about vibrio cholerae is -

- a) Disease more common in woman
- b) Classical vibrio protect against development of O-139 Tor is milder than classical
- c) El - Tor is milder than classical
- d) All

Correct Answer - C
El - Tor is milder than classical

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85. Appearance of cowdry type A inclusion bodies?

a) Granular

b) Circumscribed

c) In polio

d) None

Correct Answer - A

Ans. is 'a' i.e., Granular

- Intranuclear inclusion bodies were classified into two types by cowdry :

a) Cowdry type A :- These are of variable size and *granular in appearance*, e.g. in *herpesvirus* and *yellow fever virus*.

b) Cowdry type B :- These are more circumscribed and often multiple, as with *adenovirus* and *poliovirus*.

86. Which is enveloped virus -

a) Dengue virus

b) Norwalk virus

c) Hep A virus

d) Adenovirus

Correct Answer - A

Ans. is 'a' i.e., Dengue virus

- Dengue virus (a member of flaviviridae) is an enveloped virus.
- Adenovirus, norwalk virus (caliciviridae) and hepatitis A virus (Picornaviridae) are non-enveloped viruses.

87. Smallest DNA virus is?

a) Herpes virus

b) Adenovirus

c) Parvovirus

d) Poxvirus

Correct Answer - C

Ans. is 'c' i.e. Parvovirus

Smallest virus (also smallest DNA virus) → Parvovirus.

Largest virus (also largest DNA virus) → Pox virus.

Smallest RNA virus → Picornavirus

Largest RNA virus → Paramyxoviridae.

88. Which of the following is primary cell line ?

a) Chick embryo fibroblast

b) Hela cells

c) Vero cells

d) WI-38

Correct Answer - A

Ans. is 'a' i.e., Chick embryo fibroblast

- Chick embryo fibroblast is primary cell culture.

89. Influenza virus culture is done on ?

a) Chorioallantoic membrane

b) Allantoic cavity

c) Yolk sac

d) All

Correct Answer - B

Ans. is b i.e., Allantoic cavity

In embryonated egg cultivation for influenza virus site of inoculation are :- *Allantoic cavity or amniotic cavity*

Inoculation sites in embryonated eggs

- Chorioallantoic membrane -4 HSV, Poxvirus, Rous-sarcoma virus
- Amniotic cavity -4 Influenza virus, mumps virus
- *Allantoic cavity* - *Influenza virus*, mumps virus, avian adenovirus, newcastle disease virus
- Yolk sac --> HSV, chlamydia, rickettsia

90. Virus quantification is done *by*-

a) Egg inoculation

b) Hemadsorption

c) Plaque assay

d) Electron microscopy

Correct Answer - C

Ans. is 'c' i.e., Plaque assay

- Plaque assay and Pock assay are quantitative infective assays.

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91. Von Magnus phenomenon -

- a) Is a normal replicative cycle
- b) Virus yield has low hemagglutination
- c) Virus has high infectivity
- d) Virus yields has high hemagglutination titre but low infectivity

Correct Answer - D

Ans. is 'd' i.e. virus yields has high hemagglutination titre but low infectivity

Abnormal replicative cycles of viruses

. *Von magnus phenomenon* when cells are infected with a high dose of influenza virus, there is defective assembly during replication and the

produced virus has *high hemagglutinin titre but low infectivity*.

. *Abortive infection* Due to defective maturation or assembly, either no release of virions occur or the progeny of virus is noninfectious.

. *Defective viruses* Some viruses are genetically defective and require help of simultaneously infected helper virus for replication.
eg.

HDV, Rous sarcoma virus.

92. Lysis of bacterial colony in culture is seen by which virus -

a) Pox

b) HSV

c) Bacteriophage

d) CMV

Correct Answer - C

Ans. is 'c' i.e., Bacteriophage

- Lysis of bacteria occurs due to replication of bacteriophage in the bacteria, in lytic cycle.
- The process of lytic cycle occurs in following steps :?
 - 1) Adsorption (attachment) of a phage to the surface of a susceptible bacterium by its tail.
 - 2) Penetration of phage nucleic acid into the bacterial cells.
 - 3) Synthesis of phage components.
 - 4) Assembly of phage components into mature infective phage particles, i.e. *maturation*.
 - 5) Release of mature progeny phage.

93. Phage typing can be done for -

a) Salmonella

b) Streptococcus

c) Shigella

d) Pseudomonas

Correct Answer - A

Ans. is 'a' i.e., Salmonella

- **Phage typing** is a method used for detecting single strains of bacteria.
- It is used to trace the source of outbreaks of infections. The viruses that infect bacteria are called bacteriophages ("**phages**" for short) and some of these can only infect a single strain of bacteria.
- **Phage typing** provides a rapid, accurate, and cheap method of investigating **Salmonella** strains for epidemiological use. **Salmonella** strains within a particular serovar may be differentiated into a number of **phage** types by their pattern of susceptibility to lysis by a set of **phages** with different specificity. Phage typing is done for

- 1. Salmonella
- 2. V. cholerae

- 3. Staph aureus
- 4. Bacillus anthracis

94. Small pox belongs to which class of poxviruses ?

a) Parapoxvirus

b) Capripoxvirus

c) Leporipox virus

d) Orthopoxvirus

Correct Answer - D

Ans. is 'd' i.e., Orthopoxvirus

i) *Entomopoxvirinae* : Poxviruses of insects which do not infect vertebrates.

- Chordopoxvirinae are classified into six genera or subgroups -

i) Orthopoxvirus : These are mammalian poxviruses that tend to cause generalized infection with rash. Exmples are *variola (smallpox virus)*, vaccinia, cowpox, monnkeypox, rabbitpox, buffalopox, camelpox, mousepox.

ii) Parapoxvirus : Viruses of ungulates that may occasionally infact human, eg. Orf (contagious pustular dermatitis) and paravaccinia (milker's node, bovine pupular stomatitis).

iii) Copripoxvirus : Viruses of goat and sheeps, eg. sheep-pox, goatpox, lumpy skin disease.

iv) Leporipox virus : Viruses of of leporids (rabbits, hares, squirrels), e.g. myxoma and fibromas.

v) Avipoxvirus : Virus of birds, eg. fowlpox, turkeypox, pigeonpox, canarypox.

vi) Suipoxvirus : Virus of swine, eg. swinepox.

95. Following virus is of pox virus -

a) Variola

b) Coxsachie

c) ECHO

d) HSV

Correct Answer - A
Ans. is 'a' i.e., Variola

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96. Brick-shaped virus -

a) Chicken pox

b) Small pox

c) CMV

d) EBV

Correct Answer - B

Ans. is 'b' i.e., Small pox

Variola virus

- Belongs to *Poxviruses* enveloped DNA (ds DNA) virus.
- *Brick shaped*
- In stained preparation elementary bodies are seen —) *Paschen bodies*.
- The variola virus is the causative agent of small pox.
- On 8th may 1980 who announced global eradication of small pox.

Vaccinia virus

- It is similar to variola virus in properties.
- It is an artificial virus and does not occur in nature as such.
- Vaccinia virus is being employed as a vector for the development of recombinant vaccines.
- Vaccinia genome can accommodate about 25000 foreign base pairs, sufficient for introducing several genes.
- *Many genes have been inserted eg - HB V, HIV, rabies and for pharmacologically important products such as neuropeptides.*
- However it is not suitable as a vector for human use due to its pathogenic effects.

97. A patient with sore throat has a positive Paul Bunnell test. The causative organism is-

a) EBV

b) Adenovirus

c) CMV

d) Herpesvirus

Correct Answer - A

Ans. is 'a' i.e., EBV

· EBV associated malignancies

- Burkitt's lymphoma

- *Nasopharyngeal carcinoma*

- Hodgkin's disease (mixed cellularity type)

- Tonsillar Carcinoma

- T Cell

lymphoma

Thymoma

- Gastric carcinoma

- CNS lymphoma in AIDS and

- Angiocentric nasal NK/T cell immunoproliferative lesions
transplant recipient

- Angioimmuno- blastic lymphadenopathy

- Leiomyosarcoma Other associated nonmalignant conditions

- Oral hairy leukoplakia in AIDS patients

- Chronic fatigue syndrome

- X-linked lymphoproliferative syndrome (Duncan's disease)

Laboratory diagnosis

1. *Heterophile antibodies test*

. The standard diagnostic procedure in children and young adults is heterophile antibodies test-Paul-Bunnell Test

. A titre of 40 fold or greater is diagnostic of acute EBV infection in a patient who has symptoms compatible with infectious mononucleosis.

- Test usually remains positive for 3 months.
- Test is usually negative in children < 5 years, in elderly or in patients with symptoms not typical of infectious mononucleosis.
 - . *Monospot test for heterophile antibodies is more sensitive than the classical heterophile test.*

2. *EBV specific antibody test*

. *Used in patients who lack heterophile antibodies (children*
anti-viral capsid antigen (anti-VCA) --> most common
anti-EBV nuclear antigen (anti-EBNA)
anti - early antigen (anti - EA)

98. Coxsackie virus is -

a) Harpes virus

b) Pox virus

c) Enterovirus

d) Myxovirus

Correct Answer - C
Ans. is 'c' i.e., Enterovirus

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99. Influenza virus has -

a) 5 segments of SS RNA

b) 8 Segments of ds DNA

c) 8 segments of ssDNA

d) 8 segments of ssRNA

Correct Answer - D

Ans. is 'd' i.e., 8 segments of ssRNA

INFLUENZA VIRUS

- Belong to orthomyxoviridae —. Envelope, RNA virus
- Contain single stranded RNA which is segmented —4. 8 pieces
- There are three viral subtypes
 - 1. Type A Causes all pandemics and most of the epidemics
 - 2. Type B Can cause epidemics
 - 3. Type C —> Causes endemic infection
- Three types of influenza viruses are circulating in world —> A (H1N1), A (H3N2) and B
- A new type has been recognized -A (H5N1)
- Source of infection —> case or subclinical case
- Mode of transmission —> Droplet infection by respiratory route
- Incubation period _____ 18-72 hours
- Clinical manifestations
 - * Most infections are subclinical
 - * Fever, headache and myalgia
 - * Respiratory —> coughing
 - * There is no viremia
- Complications
 - * Pneumonia --> M.C. by str. pneumoniae
 - * Worsening of COPD

- worsening of COPD
- * Encephalitis
- * Reye's Syndrome with type B virus
- * GB. Syndrome
- * G I Symptoms (gastric flu) —i type B virus
- Laboratory diagnosis
 - * *most commonly, the diagnosis is established by the use of rapid viral tests that detect viral nucleoprotein or neuraminidase*
 - * Best specimen is nasopharyngeal secretion.

100. Hemorrhagic fever is caused *by* -

a) West-Nile fever

b) Sandfly fever

c) Ebola virus

d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Ebola virus

- Ebola virus belongs to hemorrhagic fever (see above explanation).

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101. Which of the following is not common in India ?

a) Japanese B encephalitis

b) Lassa fever

c) KFD

d) Dengue

Correct Answer - B

Ans. is 'b' i.e., Lassa fever

Some Arboviruses known to be prevalent in India

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102. Amplifier host is -

a) Pig in JE

b) Dog in rabies

c) Man in JE

d) Cattle in JE

Correct Answer - A

Ans. is 'a' i.e., Pig JE

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103. True about hepatitis A viurs ?

- a) Causes cirrhosis
- b) Helps HDV replication
- c) Common cause of hepatitis in children
- d) Causes chronic hepatitis

Correct Answer - C

Ans. is 'c' i.e., Common cause of hepatitis in children

- *HAV is the most common cause of hepatitis in children.*
- HAV does not cause chronic hepatitis or cirrhosis.
- HBV (no HAV) helps in HDV replication.

104. Serological testing of patient shows HBsAg, IgM anti-HBc and HBeAg positive. The patient has -

- a) Chronic hepatitis B with low infectivity
- b) Acute hepatitis B with high infectivity
- c) Chronic hepatitis with high infectivity
- d) Acute on chronic hepatitis

Correct Answer - B

Ans. is 'b' i.e., Acute hepatitis B with high infectivity

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105. Nef gene in HIV is for use -

a) Enhancing the expression of genes

b) Enhancing viral replication

c) Decreasing viral replication

d) Maturation

Correct Answer - C

Ans. is 'c' i.e., Decreasing viral replication

Nonstructural HIV genes

o These are ?

1) Tat (Trans-activating gene) : Enhancing the expression of all viral genes.

2) Nef (Negative factor gene) : *Down-regulating viral replication.*

3) Rev (Regulator of viral gene) : Enhancing expression of structural proteins.

4) Vif (Viral infectivity factor gene) : Influencing infectivity of viral particles.

5) Vpu (In HIV-1) and **vpx** (In HIV-2) : Enhance maturation and release of progeny of virus from cells.

6) Vpr : Stimulates promotor region.

7) LTR (Long terminal repeat) sequence : Contains sequences which give promotor, enhancer and integration signals.

106. The chance that a health worker gets HIV from an accidental needle prick is -

a) 1%

b) 10%

c) 95%

d) 100%

Correct Answer - A

Ans. is 'a' i.e., 1%

Common modes of transmission of HIV and their relative risk

Approximate Types of chance of exposure infection per exposure	
Sexual intercourse :	0.1-1.0% anal, vaginal, oral
II Blood and blood products, Factor VII transfusion	> 90% etc. Blood
III Tissue and organ semen, cornea, bone marrow, kidney etc.	50-90% donation,
IV Injections and shared needles by drug addicts	0.5-1.0% injuries;
Injections with unsterile	
Needle-stick and other injuries in health staff?	
Surgical wounds	

V Mother to baby : 30% Transplacental
At birth
After birth
Breast milk

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107. False about p24 is

- a) Seen after 3 weeks of infection
- b) Cant be seen in first week
- c) Cant be detected after seroconversion
- d) a and c

Correct Answer - D

Ans. is 'a > c' i.e., Seen after 3 weeks of infection > Cant be detected after seroconversion

Antigen detection in HIV

- Following a single massive infection, as by blood transfusion, the virus antigens may be detectable in blood *after about two weeks*. The major core antigen, p24 is the earliest virus marker to appear in the blood and is the one tested for. IgM antibodies appear in about 4-6 weeks, to be followed by IgG antibodies.
- If the infecting dose is small, as following a needle-stick injury, *the process may be considerably delayed*.
- The appearance of p24 antigenemia and viremia, followed by IgM antibody response, coincides with acute or *seroconversion illness*. *Afterwards, free p24 antigen disappears from circulation and remains absent during the long asymptomatic phase, to reappear only when severe clinical disease sets in.*
- However antibody-bound p24 antigen continues to be demonstrable, after dissociation. The p24 antigen capture assay (*ELISA*) which uses anti-p24 antibody as the solid phase can be used for this. The test is positive in about 30% of HIV infected persons. With prior dissociation of antigen-antibody complex, the positivity rate increases to about 50%.
- The test is most useful in persons recently exposed to risk of

infection, *in* whom the antibody test is negative.

Now coming to the question

- Option b & d are straight-forward. p24 antigen is detected by ELISA (enzyme immuno-assay or enzyme linked immuno-assay) and is not detectable in first week after the infection.
- Option 'a' incorrect because though the p24 antigen can be detected after 2 weeks of infection : "*The p24 antigen test can detect the p24 antigen on average 10-14 days after infection with HIV*".
"Following a single massive infection, the virus antigens may be detectable in blood after about two weeks".
- Option 'c' is partly correct and partly incorrect because :-
i) Free p24 antigen is not detectable after seroconversion.
However, in 30-50% of infected persons, antibody-bound p24 antigen can be detected after its dissociation from antibody.

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108. Which of the following is a protista-

a) Algae

b) Fungi

c) Protozoa

d) Bacteria

Correct Answer - C
Ans. is 'c' i.e., Protozoa

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109. True about trematodes

a) Two host required

b) Segmented

c) Anus present

d) Body cavity present

Correct Answer - A

Ans. is 'a' i.e., Two host required

- Medically important member of the class trematoda belong to subclass Digenea, as they are digenetic, i.e. *require two hosts*. The definitive host in which they pass the sexual or adult stage are mammals, humans or animals, and the intermediate hosts in which they pass their asexual or larval stages are freshwater molluscs or snails.
- Trematodes are unsegmented, and have no anus and body cavity.

110. Operculated eggs are seen in -

a) Nematodes

b) Cestodes

c) Trematodes

d) Protozoa

Correct Answer - C

Ans. is 'c' i.e., Trematodes

- Operculated eggs has a little cap like structure (operculum) at the end. The operculum pops open when the next stage is ready to emerge.
- The nematodes (flukes) lay operculated eggs. *An exception is schistosome egg, which are not operculated.*

111. Amoebic liver abscess can be diagnosed by demonstrating-

- a) Cysts in the sterile pus
- b) Trophozoites in the pus
- c) Cysts in the intestine
- d) Trophozoites in the feces

Correct Answer - B

Ans. is 'b' i.e., Trophozoites in the pus

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112. How many pairs of flagella does Giardia lamblia possess -

a) One

b) Two

c) Three

d) Four

Correct Answer - D

Ans. is 'd' i.e., Four

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113. A case of giardiasis presents with -

- a) Nausea and vomiting
- b) Abdominal pain
- c) Steatorrhea and flatulence
- d) All of the above

Correct Answer - D

Ans. is 'd' i.e., All of the above

Giardiasis

- * Disease manifestations of giardiasis range from asymptomatic carriage to fulminant diarrhea and *malabsorption*.
- * Most infected persons are asymptomatic
- * The mechanisms by which *Giardia* causes alteration in small bowel function are largely unknown. Although trophozoites adhere to the epithelium, *they do not cause invasive or locally destructive alterations*.
- * In most cases the morphology of the bowel is unaltered but in few cases; in chronically infected symptomatic patients; the histopathologic finding (flattened villi) and the clinical manifestations resemble those of tropical sprue and gluten sensitive enteropathy.
- Incubation period - 1 to 3 weeks
 - * Clinical manifestations
 - * Diarrhea
 - * Abdominal pain
 - * Bloating
 - * Extraintestinal - urticaria, anterior uveitis, arthritis.
 - * Nausea
 - * Vomiting
 - * Flatus
 - * *Fever, the presence of blood or mucus in the stools suggest a different diagnosis as all these are absent in giardiasis.*

114. Malarial parasite was discovered by-

a) Ronald ross

b) Paul muller

c) Laveran

d) Pampania

Correct Answer - C

Ans. is 'c' i.e., Laveran

. The specific causative agent of malaria was discovered in the red blood cells of a patient in 1880 by Alophonse Laveran, a French army surgeon in Algeria.

Remember

. Romanowsky developed a method of staining malaria parasites in blood films.

115. In malaria, sexual cycle is -

a) Sporozoite to gametocytes

b) Gametocytes to Sporozoite

c) Occurs in human

d) Responsible for relapse

Correct Answer - B

Ans. is 'b' i.e., Gametocytes to sporozoite

LIFE CYCLE OF PLASMODIUM

Plasmodium passes its life cycle in two different hosts ?

- 1. Human (intermediate host)
- 2. Female anapheline mosquito (Definitive host)

Human cycle

. Human cycle starts with the introduction of sporozoites by the bite of an infected anapheline mosquito.

. It comprises the following stages.

1) Pre - erythrocytic schizogony

- Occurs inside the parenchyma cells of the liver.
- During this phase the parasites are not found in the peripheral blood (blood is sterile).
- The liberated *merozoites* are called *cryptozoites*.
- Micromerozoites enter the circulation and start Erythrocytic schizogony, while macromerozoites re-enter the liver cells and start exoerythrocytic cycle (*exoerythrocytic cycle does not occur in P falciparum*).

- Duration of pre-erythrocytic schizogony

P. vivax	—> 8 days	P. malariae	—f
15 days			
P. falciparum —>	6 days	P. ovale	--

> 9 days

2) Erythrocytic schizogony

- Parasite resides inside the RBCs.
- Passes through the stages of trophozoite, Schizont and merozoite.
- *The parasitic multiplication during the erythrocytic phase is responsible for bringing on a clinical attack of malaria.*
- Duration

P. vivax, P. ovale, P. falciparum —> 48 hrs

P. malariae --> 72 hours

3) Gametogony

- After erythrocytic schizogony, some of the merozoites develop into gametocytes.
- *The individual who harbours the gametocytes is known as a carrier.*

4) Exoerythrocytic schizogony

- Some of merozoites, after pre-erythrocytic schizogony, reinfect liver parenchyma cells to start exoerythrocytic schizogony.
- Merozoites liberated from exo-erythrocytic schizogony are called phanerozoites.
- *It is absent in P. falciparum.*
- *It is responsible for the relapse.*

Mosquito cycle

- Sexual cycle occurs in female Anopheles.
- Gametocytes are transferred to the insect.
- Gametocytes develop into sporozoites after complete sexual cycle.
- Sporozoites are infective to man.

116. In malaria, pre-erythrocytic schizogony occurs in -

a) Lung

b) Liver

c) Spleen

d) Kidney

Correct Answer - B
Ans. is 'b' i.e., Liver

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117. Which form of the malarial parasite is present in saliva of an infective mosquito

-

a) Ring form

b) Schizont

c) Gametocyte

d) Sporozoite

Correct Answer - D

Ans. is 'd' i.e., Sporozoite

. Sporozoites are infective to man. Human infection begins when a female anopheline mosquito inoculates plasmodial *sporozoites* from its salivary gland during a blood meal.

118. Which type of malaria is associated with renal failure -

a) Falciparum

b) Vivax

c) Malariae

d) Ovale

Correct Answer - A

Ans. is 'a' i.e., Falciparum

- Nephrotic syndrome → quarta malaria (*P. malariae*)
- *Acute tubular necrosis (renal failure)* malignant tertian malaria or pernicious malaria (caused by *P falciparum*).

119. Malaria causing nephrotic syndrome -

a) *P. vivax*

b) *P. falciparum*

c) *P. malariae*

d) *P. ovale*

Correct Answer - C

Ans. is 'c' i.e., *P. malariae*

Nephrotic syndrome is seen in Quartan malarial nephropathy, caused by repeated or chronic infection with *P. malariae*.

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120. JSB stain is used for which parasite ?

a) Malaria

b) Filaria

c) Kala azar

d) Sleeping sickness

Correct Answer - A

Ans. is 'a' i.e., Malaria

- JSB (Jaswant-Singh-Bhattacharji) stain is a fairly rapid staining method for the detection of malarial parasites.
 - This stain is superior to the field's stain because the parasites stain clearer and *both thick and thin smears can be stained*.
 - However, preparations fade quite rapidly and this stain is, therefore, not recommended when permanent slides are desired.
- Stains used for staining malarial smears
- A number of Romanowsky stains are used for example *Field's*, *Giemsa's*, *Wright's* and *Leishman's*.
 - For thick smear, the stains used are : (i) *Field's* or (ii) *Giemsa's*.
 - For thin smear, the stains used are (i) *Giemsa's* or (ii) *Leishman's*.
 - JSB stain is used for both thick and thin smears, and is the standard method used by laboratories under the National Malaria Eradication Programme in India.

121. Cylindrical helminths are -

a) Tapeworms

b) Flukes

c) Roundworms

d) Cestodes

Correct Answer - C

Ans. is 'c' i.e., Roundworms

Helminths (metazoa) are divided into ?

- 1. Nematelminthes: These are *cylindrical (round)*, therefore are called round-worms (nematodes).
 - 2. Platyhelminthes: These are *flat* and divided into :
 - *Cestodes (tapeworms)*: These are *segmented*
 - *Trematodes (flukes)*: These are leaf-like
- Cylindrical Helminths → Nematodes(round-worms)
Flat segmented helminths → Cestodes (tape-worms)
Flat, leaf-like helminths → Trematodes (flukes)

122. Consumption of uncooked pork is likely to cause which of the following helminthic disease -

a) *Taenia saginata*

b) *Taenia solium*

c) *Trichuris trichiura*

d) None of these

Correct Answer - B

Ans. is 'b' i.e., *Taenia solium*

Humans acquire intestinal tapeworm infection by ingesting undercooked pork containing cysticerci.

Mode of infection of tapeworms

1. *T. saginata* --> Under cooked beef contains cysticercus bovis.
2. *T solium* --> Undercooked pork containing cysticercus cellulosae & rarely by ingestion of egg (autoinfection.)
3. *Trichuris - trichiura* caused by ingestion of infective egg via faeco-oral route from contaminated soil.
4. Hydatid cyst is caused by ingestion of infectious egg via faeco-oral route from contaminated soil.

123. Katayama fever is caused by -

a) *F. hepatica*

b) *C. sinensis*

c) *S. haematobium*

d) *A. lumbricoides*

Correct Answer - C

Ans. is 'c' i.e., *S. haematobium*

Katayama fever (Acute Schistosomiasis) occurs in about a month after infection with *S. japonicum* and *S. mansoni* and rarely with *S. haematobium*.

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124. Child having perianal pruritus with following eggs is due to -

a) **E. vermicularis**

b) Ascaris

c) Ancylostoma duodenale

d) S stercoralis

Correct Answer - A

Ans. is 'a' i.e., E. vermicularis

Clinical features of thread worm Infections

- * Most pinworm infections are asymptomatic.
- * *Perianal pruritis is the cardinal symptom.* The itching, is worse at night and disturbs sleep.
- * Heavy infections can cause *abdominal pain* and weight loss.
- * Nocturnal enuresis
- * Vulvovaginitis
- * Pelvic and peritoneal granulomas rare
- * Appendicitis
- * Salpingitis

125. Wucheria bancrofti, true is -

- a) Unsheathed
- b) Tail tip free from nuclei
- c) Non-periodic
- d) All

Correct Answer - B

Ans. is 'b' i.e., Tail tip free from nuclei

W. bancrofti is sheathed and periodic with tail tip free from nuclei.

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126. Calabar swelling is produced by?

a) Onchocerca volvulus

b) Loa loa

c) Burgia malayi

d) Wuchereria bancrofti

Correct Answer - B

Ans. is 'b' i.e., Loa - Loa

Loiasis

- Loiasis is caused by L. Loa (*the African eye worm*)
- Habitat of adult worms is subcutaneous connective tissue of man; often in the *sub-conjunctival tissue of the eye*.

The worm passes its life cycle in two hosts :

1) Man & 2) Chrysops (Mango or deer flies)

C/Fs → Asymptomatic microfilaremia, Calabar (fugitive) swelling - subcutaneous swelling, Nephropathy, Encephalopathy (rare), Cardiomyopathy

Calabar swelling is due to hypersensitivity reaction to the adult worm.

127. River blindness is caused by -

a) Onchocerca

b) Loa loa

c) Ascaris

d) B. malayi

Correct Answer - A

Ans. is 'a' i.e., Onchocerca

- Onchocerciasis is also known as River blindness and Robles disease.

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128. Cutaneous larva migrans is due to ?

a) Ankylostoma braziliensis

b) W.bancrofti

c) B. Malayi

d) D. medinensis

Correct Answer - A

Ans. is 'a' i.e., Ankylostoma braziliense

Larva migrans

. Certain nematode larvae on entering into unnatural host (e.g. man) may not be able to complete their journey through the host's tissues for localization in their normal abode.

. Two different types of conditions are produced.

- | | |
|--|---------------------------|
| .. Entering by skin penetration or creeping eruption | - Cutaneous larva migrans |
| ?. Entering via oral route | - Visceral larva migrans. |

129. Schistosomiasis is transmitted by ?

a) Cyclops

b) Fish

c) Snail

d) Cattle

Correct Answer - C

Ans. is 'c' i.e., Snails

- Intermediate host for schistosoma sp. is snail.

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130. Cercariae are infective form of-

a) S. hematobium

b) P. westermanii

c) F. hepatica

d) T. solium

Correct Answer - A

Ans. is 'a' i.e., S. hematobium

- Cercaria of Schistosoma hematobium is the infective form.

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131. Which of the following is toxic to parasite -

a) Peroxidase

b) Interferon

c) IL-2

d) IL-6

Correct Answer - A

Ans. is 'a' i.e., Peroxidase

- Neutrophils and monocytes contain a peroxidase (myeloperoxidase), that has been implicated in antiparasitic activity. However, monocytes lose this enzyme when they mature into macrophages.
- Eosinophils also contain peroxidase that differs from myeloperoxidase of neutrophils. However, like myeloperoxidase, eosinophil peroxidase combines with H_2O , and a halide to form an antiparasite system.

Parasite

Egg size

- | | |
|----------------------------|----------------|
| 1) Fasciola gigantica | 190 X 100 m |
| 2) Echinostoma ilioecum | 100 X 70 m |
| 3) Gastrodiscoides hominis | 150 X 70-100 m |
| 4) Opisthorcis viverrini | <30 X 15 m |

132. Hanging drop method is used for-

a) *T. trichomonas*

b) *Plasmodium*

c) *Toxoplasma*

d) *Cryptosporidium*

Correct Answer - A

Ans. is 'a' i.e., *T. trichomonas*

- Hanging drop method is used for examining motility of micro-organisms.
- Motility of *trichomonas vaginalis* may also be observed by this method.

133. Which of the following is true about malaria ?

- a) Gametocyte harbourers are carrier
- b) All stage in erythrocytic schizogony seen in falciparum infection in peripheral blood
- c) Schizonts of vivax do not completely fill the RBC
- d) All the correct

Correct Answer - A

Ans. is 'a' i.e., Gametocyte harbourers are carrier

- * The individual who harbours the gametocytes is known as a carrier.
- * Only ring form (young trophozoites) and gametocytes are seen in peripheral blood.
- * Schizont of *P. vivax* almost completely fills an enlarged R.B.C.

134. Which of the following is only yeast ?

a) Candida

b) Mucor

c) Rhizopus

d) Cryptococcus

Correct Answer - D
Ans. is d i.e., Cryptococcus

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135. The fungus with septate hyphae and dichotomous branching is -

a) Aspergillus

b) Penicillium

c) Mucor

d) Rhizopus

Correct Answer - A

Ans. is 'a' i.e., Aspergillus

- Septate hyphae with dichotomous branching into two equal divisions at a regular angle of 45° are typical of Aspergillus.
- Mucor and rhizopus are non-septate (aseptate) and penicillium has no hyphae (It is yeast like fungus).

136. Acute angled septate hyphae are seen in ?

a) Aspergillus

b) Mucor

c) Penicillium

d) Candida

Correct Answer - A

Ans. is 'a' i.e., Aspergillus

- *Septate hyphae with acute branching is characteristic of aspergillus.*

137. Aseptate hyphae is not seen in -

a) Rhizopus

b) Mucor

c) Aspergillus

d) None

Correct Answer - C

Ans. is 'c' i.e., Aspergillus

- Non-septate (aseptate) hyphae --> Rhizopus, mucor.
- Septate hyphae —> Aspergillus.

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138. Which of the following is false regarding dimorphic fungi -

- a) Occurs in two growth forms
- b) Can cause systemic infection
- c) Cryptococcus is an example
- d) Coccidioides is an example

Correct Answer - C

Ans. is 'c' i.e., Cryptococcus is an example

Dimorphic fungi

- Fungi that have *two growth forms*, such as *mold (filaments)* and a *yeast*, which develop under different growth conditions.
 - . *In host tissues or cultures at 37°C they occur as yeasts, while in the soil and in cultures at 22°C they appear as moulds.*
 - . Most fungi causing systemic infections are dimorphic fungi.
- Note - *Candida albicans* is a dimorphic fungus, while other species of *candida* are not dimorphic.

139. Trichophyton species which is zoophilic ?

a) *T. tonsurans*

b) *T. violaceum*

c) *T. schoenleinii*

d) *T. mentagrophytes*

Correct Answer - D

Ans. is 'd' i.e. *T. mentagrophytes*

- Zoophilic dermatophytes are the species which primarily infect animals and occasionally transmitted to humans.
- Zoophilic species of trichophyton are *T. mentagrophytes* and *T. verrucosum*.
- Other zoophilic species of dermatophytes is *M. canis*.

140. Tinea cruris is caused by -

a) Epidermophyton

b) Trichophyton

c) Microsporum

d) a and b

Correct Answer - D

Ans. is 'a' i.e., Epidermophyton; 'b' i.e., Trichophyton

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141. Hair perforation test is positive in infection with ?

a) Trichophyton

b) Microsporum

c) Epidermophyton

d) All of the above

Correct Answer - A

Ans. is 'a' i.e., Trichophyton

Hair perforation test

. The hair perforation test consists of inoculating colonies of an organism into a dish containing a small amount of water, a few drops of yeast extract solution and some human hair. The dish is incubated at 30°C and after 7 days, some of the hair are taken and are kept on a slide with a coverslip and are observed under a microscope. The test is considered positive if the hair has deep, narrow wedge shaped perforation in it.

. Hair perforation test is done to distinguish between isolates of dermatophytes, particularly *trichophyton mentagrophytes* and its variants.

142. Color of granules in mycetoma caused by *Actinomadura pelletierii* :-

a) Black

b) Yellow

c) Red

d) Brown

Correct Answer - C

Ans. is 'c' i.e., Red

Colour of Grains in Mycetomas of Various Etiology

White to Yellow	Brown to Black	Red
1) <i>Nocardia asteroides</i>	1) <i>Madurella mycetomi</i>	1) <i>Actinomadura pelletierii</i>
2) <i>Nocardia brasiliensis</i>	2) <i>Madurella grisea</i>	
3) <i>Actinomadura madurae</i>	3) <i>Phialophora jeanselmei</i>	
4) <i>Streptomyces somaliensis</i>		
5) <i>Allescheria boydii</i>		

143. Aspergillus causes all except ?

a) Bronchopulmonary allergy

b) Otomycosis

c) Dermatophytosis

d) *Allergic sinusitis*

Correct Answer - C

Ans. is 'c' i.e., Dermatophytosis

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144. Valley fever or desert rheumatism is caused by ?

a) Sporothrix

b) Cladosporium

c) Phialophora

d) None

Correct Answer - D

Ans. is 'None'

Ans. is 'None'

Coccidioidomycosis, commonly known as **cocci**, **Valley fever**, as well as **California fever**, **desert rheumatism**, and **San Joaquin Valley fever**, is a mammalian fungal disease caused by *Coccidioides immitis* or *Coccidioides posadasii*.

The scientific name for **Valley fever** is “coccidioidomycosis,” and it's also sometimes called “San Joaquin **Valley fever**” or “**desert rheumatism**.”

The term “**Valley fever**” usually refers to *Coccidioides* infection in the lungs, but the infection can spread to other parts of the body in severe cases.

145. A plant prick can produce sporotrichosis. All are true statements about sporotrichosis except -

- a) Is a chronic mycotic disease that typically involves skin, subcutaneous tissue and regional lymphatics
- b) Most cases are acquired via cutaneous inoculation
- c) Enlarged lymph nodes extending centripetally as a beaded chain are a characteristic finding
- d) It is an occupational disease of butchers, doctors

Correct Answer - D

Ans. is 'd' i.e., It is an occupational disease of butchers, doctors

- * Sporotrichosis is caused by the thermally dimorphic fungus *sporothrix schenckii*.
- * Because *S.schenckii* naturally found in soil, hay, sphagnum moss, and plants, it usually affects farmers, *gardeners*, and agricultural workers.
- * This fungal disease *usually affects the skin* although rare forms can affect the lungs, joints, bones and CNS.
- * Fungus enters through *small cuts and abrasions* in the skin to cause the infection.
- * Because roses can spread the disease, it is one of a few diseases referred to as *rose-thorn or rose gardener's disease*. Forms and symptoms of sporotrichosis:
 - 1) *Cutaneous (skin) sporotrichosis*
 - * This is the *most common form* of this disease.
 - * Symptoms of this form includes nodular lesions or bumps in the skin, at the point of entry and *also along lymph nodes and vessels*.
 - * The lesion starts off as small and painless nodule and rashes in

The lesion starts off as small and painless, nodule and ranges in colour from pink to purple.

- * Left untreated, the lesion becomes larger and looks similar to a boil and more lesions will appear, until a chronic ulcer develops.

- * *Usually cutaneous sporotrichosis lesions occurs in the finger, hand and arm.*

2) Pulmonary sporotrichosis

- * This rare form of the disease occur when *S.schenckii* spores are *inhaled*.

- * Symptoms include productive cough, nodules, cavitations and fibrosis of lungs; and hilar lymph node enlargement.

- * Patients with this form of sporotrichosis are susceptible to developing tuberculosis and pneumonia.

3) Disseminated sporotrichosis

- * When the infection spreads from the primary site to secondary sites in the body, the disease develops into a rare and critical form called disseminated sporotrichosis.

- * The infection can spread to joints and bones (called osteoarticular sporotrichosis) as well as the CNS and brain (sporotrichosis meningitis).

146. Which is false about penicillium marsefii -

- a) Black colonies
- b) Dimorphic fungi
- c) Amphotericin B used for treatment
- d) Causes fulminant infections in immunocompromised patients

Correct Answer - A

Ans. is 'a' i.e., Black colonies

Penicillium marneffeii

- *Penicillium marneffeii* cause serious disseminated disease with characteristic papular skin lesion in AIDS Patients in South-East Asia.
- The fungus is *dimorphic*, forming yeast-like cells that are often intracellular, *resembling histoplasmosis*, in infected tissues.
- The yeast phase (37°C) displays colonies that are white to tan, soft and dry.
- The most distinguishing characteristic of mould phase (at 25° C) is the early presence of red pigment that diffuses into agar. The colonies start as pinkish-yellow and evolve into a bluish-green color in the center with a white periphery.
- It is associated with bamboo rat (*Rhizomys sinensis*) and has been isolated from their burrows and internal organs.
- Treatment is amphotericin B, followed by itraconazole to prevent relapse.

147. Neurotropic fungus is/are -

a) Cryptococcus neoformans

b) Histoplasmosis

c) Trichophyton

d) a and b

Correct Answer - D

Ans. is 'a' i.e., Cryptococcus neoformans; 'b' i.e., Histoplasmosis

Fungi infecting the brain are

- Cryptococcus neoformans
- Blastomyces dermatitidis
- Coccidioides immitis
- Aspergillus sp.
- Candida sp.
- Sporothrix schenckii
- Histoplasma capsulatum

148. *Pneumocystis carinii* is diagnosed by -

- a) Sputum examination for trophozoites and cyst under microscope
- b) Culture
- c) Positive serology
- d) Growth on artificial media

Correct Answer - A

Ans. is 'a' i.e., Sputum examination for trophozoites and cyst under microscope

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149. Bacteria showing antigenic variation ?

a) Yersinia

b) Bordetella

c) Brucella

d) Borrelia

Correct Answer - D

Ans. is 'd' i.e., Borrelia

- Bacteria showing antigenic variation are :?
 - i) Neisseria (Meningococci, Gonococci)
 - ii) Streptococcus spp
 - iii) Mycoplasma
 - iv) *Borrelia burgdorferi*

150. Bioterrorism group A agent

a) Q fever

b) Typhus fever

c) Brucella

d) Antrax

Correct Answer - D
Ans. is 'd' i.e., Antrax

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151. Which of the following belongs to category-B of bioterrorism -

a) Cholera

b) Anthrox

c) Plague

d) Botulism

Correct Answer - A
Ans. is 'a' i.e., Cholera

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152. Most common mode of transmission of nosocomial infection is -

- a) Hand contact
- b) Droplet infection
- c) Blood and blood products
- d) Contaminated water

Correct Answer - A

Ans. is 'a' i.e., Hand contact

Modes of transmission of nosocomial infections

- There are following types of modes of transmission of hospital-acquired infections.
 - 1) Contact transmission
 - * It is the *most common and most preventable means of transmission*. It is divided into two types -
 - i) *Direct contact* : It involves contact of body surface to body surface with a physical transfer of microorganisms. *Hand contact is most common mode of transmission*.
 - ii) *Indirect contact* : It involves body surface contact with a contaminated intermediate object.
 - 2) Droplet transmission
 - * It occurs when droplet containing microorganisms from an infected person are propelled through the air (e.g. coughing, sneezing) and land on the mouth, eyes or nose of another person.
 - 3) Airborne transmission
 - * It results when a droplet containing microorganisms evaporates and remains suspended in air for a long time (this should not be confused with droplet infection, in which transmission is immediate and droplets do not remain suspended in the air).

* Airborne transmission also occurs by dust particles containing microorganism.

4) Vehicle transmission

* It refers to transmission of infection by contaminated items such as food, water, medications, devices and equipment.

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153. Most common organism involved in nosocomial infection -

a) Staph aureus

b) E. coli

c) Legionella

d) Strep pneumonia

Correct Answer - A

Ans. is 'a' i.e., Staph aureus

- . UTI is the most common type of nosocomial infection.
- . Most common cause of UTI ---> E coli
- . Most common cause of UTI in ICU ----> Candida
- . *Overall staph aureus is a leading cause of nosocomial infection.*
- . Staph aureus is the most common cause of surgical wound infection -
- . Most common cause of primary bacteremia --> Coagulase negative staphylococcus.

154. Most common organism causing ventilator associated pneumonia -

- a) Legionella
- b) Pneumococcus
- c) Pseudomonas
- d) Coagulase negative staphylococcus

Correct Answer - C

Ans. is 'c' i.e., Pseudomonas

- *Staphylococcus aureus* and *Pseudomonas aeruginosa* cause most of the cases of ventilator associated pneumonia (VAP).
- Other common organisms causing VAP are *enterococcus faecium*, *Acinetobacter baumannii*, *enterobacter species* and *klebsiella pneumoniae*.
- Mnemonic : ESKAPE (Enterococcus, staphylococcus, klebsiella, Acinetobacter, Pseudomonas, enterobacter).
- As single most common organism, pseudomonas is the causative agent ?

- <i>Pseudomonas aeruginosa</i>	—>21%
- <i>Staphylococcus aureus</i>	—>20%
- <i>Enterobacter species</i>	—>9%
- <i>Klebsiella pneumoniae</i>	—>8%
- <i>Acinetobacter</i>	—>6%

155. In donovanosis-

- a) Pseudolymphadenopathy
- b) Penicillin is used for treatment
- c) Painful ulcer
- d) Suppurative lymphadenopathy

Correct Answer - A

Ans. is 'a' i.e., Pseudolymphadenopathy

Donovanosis

- Caused by *Calymmatobacterium granulomatis*.

C. granulomatis is ?

- Gram negative
- Encapsulated
- Nonmotile

Intracellular

- It shares many morphologic and serologic characteristic (antigenic) and > 99% homology at the nucleotide level with *Klebsiella*.
- Clinical manifestations
IP → 1-4 weeks
- Begins as one or more subcutaneous nodules that erode through skin to produce clean, granulomatous, sharply defined, usually painless lesions.
- The genitalia are involved in 90% of cases.
- Genital swelling, particularly of labia, is common.
- In donovanosis, heaped-up granulomatous tissue may follow and via subcutaneous extension to inguinal area may form "pseudo-buboes"; however, the absence of true lymphadenopathy is the hallmark of this infection.
- Complications Pseudoelephantiasis, phimosis and paraphimosis.

Diagnosis:

- The preferred diagnostic method involves demonstration of typical intracellular Donovan bodies within large mononuclear cells visualized in smears prepared from lesions or biopsy specimens.
- Stain used is wright - Giemsa

Treatment:

- Azithromycin (DOC)
- Doxycycline (2nd choice)
- Chloramphenicol

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156. An adolescent male developed vomiting and diarrhea 1 hour after having food from a restaurant. The most likely pathogen is?

a) *Clostridium perfringens*

b) *Vibrio parahaemolyticus*

c) *Staphylococcus aureus*

d) *Salmonella*

Correct Answer - C

Ans. is 'c' i.e., *Staphylococcus aureus*

. Among the given options, only *staphylococcus* can cause gastroenteritis within 6 hours.

157. 18 years old girl presents with watery diarrhea. Most likely causative agent -

a) Rota virus

b) V. cholerae

c) Salmonella

d) Shigella

Correct Answer - B

Ans. is 'b' i.e., V. cholerae

Amongst the given options Rotavirus and V. cholerae cause watery diarrhea.

Acute watery diarrhea in children is usually bacterial in origin, most commonly due to enterotoxigenic E. coli (ETEC). V cholerae is also a common cause.

Rota virus is the most common cause of diarrhea in infant and children (the patient in question is adult).

158. The predominant colonic bacteria are -

a) Largely aerobic

b) Largely anaerobic

c) Bacteroides

d) Staphylococci

Correct Answer - B

Ans. is 'b' i.e., Largely anaerobic

* In the adult normal colon, the resident bacterial flora are mostly (96 - 99 per cent) anaerobes :

* Anaerobic streptococci (Peptostreptococci)

-

Clostridia

* Anaerobic lactobacilli (bifidobacteria)

-

Bacteroides

* 1-4 per cent are aerobes :

* Enterococci

* Pseudomonas

* Coliforms

*

Lactobacilli * Proteus Remember

* In duodenum and upper ileum, predominant organisms are —>

Lactobacilli and enterococci.

* In lower ileum and cecum —> Flora resemble the fecal flora.

159. Memory cells are:
September 2004

a) Basophils

b) Eosinophils

c) Lymphocytes

d) Neutrophils

Correct Answer - C
Ans. C i.e. Lymphocytes

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160. Complement Fixation test is: *September 2005*

- a) VIDAL
- b) Coombs test
- c) Wassermann reaction
- d) VDRL

Correct Answer - C

Ans. C: Wassermann reaction

The complement fixation test (CFT) was extensively used in syphilis serology after being introduced by Wasserman in 1906. However, there is now a trend to replace the CFT with the simple flocculation tests.

Although CFT is considered to be a relatively simple test, it is a very exacting procedure because 5 variables are involved. In essence the test consists of two antigen-antibody reactions, one of which is the indicator system.

The first reaction, between a known virus antigen and a specific antibody takes place in the presence of a predetermined amount of complement. The complement is removed or "fixed" by the antigen-antibody complex.

The second antigen-antibody reaction consists of reacting sheep RBC with haemolysin. When this indicator system is added to the reactants, the sensitized RBCs will only lyse in the presence of free complement. The antigens used for CFT tend to be group antigens rather than type-specific antigens. In order for the CFT to be set up correctly, the optimal concentration of haemolytic serum, complement, and antigen should be determined by titration.

The Wassermann test is no longer in use.

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161. Confirmatory test for Syphilis is: *September 2010 March 2013*

- a) VDRL
- b) Rapid plasma reagin test
- c) FT-ABS
- d) All of the above

Correct Answer - C

Ans. C: FT-ABS

T. pallidum cannot be grown in vitro

Diagnostic tests for syphilis: Tests include serologic tests for syphilis (STS), which consist of screening (reagin) and confirmatory (treponemal) tests, and dark field microscopy.

Reagin tests use lipid antigens (cardiolipin from bovine hearts) to detect reagin (human antibodies that bind to lipids). The Venereal Disease Research Laboratory (VDRL) and rapid plasma reagin (RPR) tests are sensitive, simple, and inexpensive reaginic tests that are used for screening but are not specific for syphilis. Results may be presented qualitatively (e.g., reactive, weakly reactive, borderline, or nonreactive) and quantitatively as titers (e.g., positive at 1:16 dilution).

Many disorders other than treponemal infections (e.g., SLE, antiphospholipid antibody syndromes) can produce a positive (biologically false-positive) reagin test result. CSF reaginic tests are reasonably sensitive for early disease but less so for late neurosyphilis. CSF reagin tests can be used to diagnose neurosyphilis or to monitor response to treatment by measuring antibody titers.

Treponemal tests detect antitreponemal antibodies qualitatively

and are very specific for syphilis. They include the following:

- Fluorescent treponemal antibody absorption (FTA-ABS) test
- Microhemagglutination assay for antibodies to *T. pallidum* (MHA-TP)
- *T. pallidum* hemagglutination assay (TPHA)

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162. Nosocomial infection is most commonly caused by:
March 2004

a) Gram negative bacilli

b) Gram positive bacilli

c) Gram negative cocci

d) Mycoplasma

Correct Answer - A

Ans. A i.e. Gram negative bacilli

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163. Enteric fever is caused by:
September 2005

- a) *Salmonella typhi*
- b) *Salmonella paratyphi A*
- c) *Salmonella paratyphi B*
- d) All of the above

Correct Answer - D

Ans. D: All of the above

Typhoid fever is caused by *Salmonella typhi*.

Paratyphoid fever is caused by *Salmonella paratyphi A*, B and C.

The term enteric fever encompasses both typhoid and paratyphoid fevers.

164. Ghon's focus reflects:

September 2005

- a) Miliary tuberculosis
- b) Primary complex
- c) Tuberculous lymphadenitis
- d) Post primary tuberculosis

Correct Answer - B

Ans. B: Primary complex

Only a very small percent of *Mycobacterium tuberculosis* (MTB) infections result in disease, and even a smaller percentage of MTB infections progress to an advanced stage.

The bacilli is engulfed by alveolar macrophages multiply and give rise to a subpleural focus of tuberculous pneumonia, commonly located in the lower lobe or the lower part of the upper lobe. This is known as Ghon focus.

The Ghon focus together with the enlarged hilar lymph node constitutes the primary complex.

Small metastatic foci containing low numbers of MTB may also calcify.

However, in many cases these foci will contain viable organisms.

These foci are referred to as Simon foci.

The Simon foci are also visible upon chest X-ray and are often the site of disease reactivation.

165. Diphtheria toxin's mechanism of action is:

September 2009

- a) Inhibiting glucose synthesis
- b) Inhibiting protein synthesis
- c) Promoting acetylcholine release
- d) Altering cyclic GMP levels

Correct Answer - B

Ans. B: Inhibiting protein synthesis

The diphtheria toxin causes the death eucaryotic cells and tissues by inhibition of protein synthesis in the cells. Although the toxin is responsible for the lethal symptoms of the disease, the virulence of *C. diphtheriae* cannot be attributed to toxigenicity alone, since a distinct invasive phase apparently precedes toxigenesis.

166. Most serious complication of measles is:
September 2008

a) Croup

b) Meningo-encephalitis

c) Otitis media

d) Pneumonia

Correct Answer - B

Ans. B: Meningo-encephalitis

Measles is a highly communicable acute disease. It is also known as rubeola and is marked by prodromal fever, cough, coryza, conjunctivitis, and pathognomonic enanthem (i.e., Koplik spots), followed by an erythematous maculopapular rash on the third to seventh day.

Infection confers life-long immunity.

A generalized immunosuppression that follows acute measles frequently predisposes patients to bacterial otitis media and bronchopneumonia.

In approximately 0.1% of cases, measles causes acute meningo-encephalitis, which is the most serious complication. Subacute sclerosing panencephalitis (SSPE) is a rare chronic degenerative disease that occurs several years after measles infection.

167.

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Promastigote form of Leishmania is found in which part of sandfly:

March 2005

a) Lymph node

b) GIT

c) Spleen

d) Bone marrow

Correct Answer - B

Ans. B: GIT

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168. For phage typing, how many phages of staphylococcus aureus are used ?

a) 12

b) 15

c) 20

d) 23

Correct Answer - D

Ans. is' D i.e., 23

- Bacteriophage typing of staphylococcus is based on the susceptibility of cocci to bacteriophages.
- This is carried out by pattern method where a set of *23 standard typing phages of S. aureus is used* to type staphylococcal isolates and distinguish them from one another by their patterns of susceptibility to lysis.
- The phage-type of a strain is known by the designation of the phages that lyse it.
- For example, if a strain is lysed by phages 83A, 84 and 85, it is called type 83A/84/85.

169. Most common biotype of *S. aureus* causing human infection ?

a) A

b) B

c) C

d) D

Correct Answer - A

Ans. is 'a' i.e., A

Staphylococcus aureus has been classified into six biotypes : A, B, C, D, E and F.

Most human pathogenic strains belong to biotype A.

170. Most common pox virus infection in human is ?

a) Smallpox

b) Monkeypox

c) Cowpox

d) Mulluscum contagiosum

Correct Answer - D

Ans. is 'd' i.e., Mulluscum contagiosum

Among the given options, smallpox (variola) virus and molluscum contagiosum affect human as their primary host.

- Small pox has been eradicated.
- Molluscum contagiosum is a common skin infection.

171. HHV-6 causes ?

a) Erythema infectiosum

b) Kaposi sarcoma

c) Roseola infantum

d) Herpangina

Correct Answer - C

Ans. is 'c' i.e., Roseola infantum

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172. Phenylalanine deaminase test is positive in ?

a) Salmonella

b) Proteus

c) Vibrio cholerae

d) Helicobacter

Correct Answer - B

Ans. is 'b' i.e., Proteus

The distinctive character of proteus genus is deamination of phenyl alanine to phenyl pyruvic acid (PPA + ye)

173. Gram positive, catalase negative cocci ?

a) Staph aureus

b) Staph epidermidis

c) Staph saprophyticus

d) Pneumococcus

Correct Answer - D

Ans. is 'd' i.e., Pneumococcus

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174. R-factor in bacteria is transferred by ?

a) Transduction

b) Transformation

c) Conjugation

d) Vertical transmission

Correct Answer - C

Ans. is 'c' i.e., Conjugation

Conjugation

- Bacterial conjugation is the transfer of genetic material between bacteria through direct cell to cell contact or through a bridge- like connection between two cells.
- Conjugation is process where by a donor (male) bacterium makes physical contact with a recipient (female) bacterium.
- *Donor status is determined by the presence of plasmid.*
- This plasmid codes for *specialized fimbria (sex pilus)* and for self transfer.
- Sex pilus (conjugation tube) helps in transfer of genetic material from male bacterium to female bacterium.
- The plasmid is known as *transfer factor* (sex factor or fertility factor).
- *Plasmid may be R factor, which codes for transferrable multiple drug resistance.*
- The DNA of the plasmid replicates during transfer so that each bacterium receives a copy Recipient becomes donor and the donor retains its donor status.

175. Feces are disinfected best by ?

a) 1% formaldehyde

b) 5% cresol

c) 5% phenol

d) Isopropyl alcohol

Correct Answer - B

Ans. is 'b' i.e., 5% cresol

"The most effective disinfectant for general use is a coal-tar disinfectant with a Rideal-Walker (RW) coefficient of 10 or more such as cresol".

176. Stool specimen is transported in ?

- a) Cary blair medium
- b) Blood agar
- c) Selenite F broth
- d) Compy BAP medium

Correct Answer - A

Ans. is 'a' i.e., Cary blair medium

Transport media for stool specimen are :?

- a. *Cary-Blair medium*
- b. Buffered glycerol saline
- c. Stuart medium

Inoculate media for routine stool culture are :-

- a. *Blood agar*
- b. *MacConkey agar*
- c. Hektoen enteric HE (agar)
- d. Selective media for campylobactor : Campy BAP, skirrow
- e. *Selenite F broth* or GN Broth
- f. Xylose-lysine deoxycholate agar (XLD agar)

For specific situations, selective media are used :-

- i. *Vibrio* : TCBS agar or Alkaline peptone broth.
- ii. *Yersinia* : Cefsulodin-Irgasan-Novobiosin (CIN) agar or Phosphate Buffered Saline (PBS) broth.
- iii. *E.coli* 0157:H7: Sarbitol-MacConkey agar.

177. HEPA filter is used to disinfect ?

a) Water

b) Air

c) Culture

d) Blood

Correct Answer - B

Ans. is 'b' i.e., Air

HEPA (High-efficiency particulate air) filter is used to remove microorganisms from air.

HEPA filter traps airborne particles and microbes.

It can remove > 95% of all particles including microorganisms with a diameter > 0.3 μ m.

178. Virus most sensitive to inactivation by biocides ?

a) Adenovirus

b) Herpes virus

c) Parvovirus

d) Poliovirus

Correct Answer - B

Ans. is 'b' i.e., Herpes virus

Enveloped viruses are most sensitive to inactivation by biocides.

Among the given options only Herpesvirus is enveloped virus.

Adenovirus, parvovirus and poliovirus (picornavirus) are non-enveloped viruses.

179. Complement components are ?

a) Lipoproteins

b) Glycoproteins

c) Polysaccharides

d) Lipid

Correct Answer - B

Ans. is 'b' i.e., Glycoproteins

The proteins and glycoproteins that constitute the complement system are synthesized by hepatocytes" — Internet

"Most of the complement glycoproteins are synthesized predominantly by the liver, but macrophages and many other cell types are also sources of various complement components" -

Medical immunology

"Complement components are glycoproteins" — Textbook of Human Blood Plasma Proteins

180. True about *Campylobacter jejuni* ?

- a) Obligate aerobe
- b) Oxidase negative
- c) Grows at 42°C
- d) Non-motile

Correct Answer - C

Ans. is 'C' i.e., Grows at 42°C

Campylobacter jejuni

Morphology

- Gram negative
- Comma shaped
- Motile with a single polar flagellum → Darting or tumbling motility
- Non capsulated
- Non Sporing

Culture

- Growth occurs under microaerophilic conditions (5% O₂, 10% CO₂ and 85% N₂).
- Thermophilic, growing at 42°C (Can grow at 37°C, but incubation at higher temperatures suppresses normal fecal flora.)

Biochemical reactions

- Do not ferment carbohydrate
- Catalase and oxidase-positive
- Nitrate reduction positive

181. Best indicator for sterilization by autoclaving ?

a) *Bacillus subtilis*

b) *Geobacillus*

c) *Bacillus pumilis*

d) *Clostridium*

Correct Answer - B

Ans. is 'b' i.e., *Geobacillus*

Biological indicators

- Biological indicators are standardised preparations of microorganisms used to assess the effectiveness of a sterilization process.
- They usually consist of a population of bacterial spores placed on an inert carrier, for example a strip of filter paper, a glass slide or a plastic tube.
- Most commonly, spores of *Bacillus stearothermophilus* (*Geobacillus stearothermophilus*) are used. Spores of *Bacillus subtilis* and *Bacillus pumilis* are also used.

182. Satellitism is seen in cultures of?

a) Hemophilus

b) Streptococcus

c) Klebsiella

d) Proteus

Correct Answer - A

Ans. is 'a' i.e., Haemophilus

Satellitism

- The growth of Haemophilus influenzae is scanty on blood agar, as the factor V is not freely available, being imprisoned inside the red blood cells. Growth is, therefore, better if the source of the V factor is also provided.
- When Staph aureus is streaked across a plate of blood agar on which a specimen containing H. influenzae has been inoculated, after overnight incubation, the colonies of H. influenzae will be large and well developed alongside the streak of staphylococcus, and smaller further away. This phenomenon is called satellitism.
- Satellitism is due to a high concentration of factor 'V' in staph aureus which is released into medium and is used by H. influenzae.

183. Varicella zoster virus belongs to which family of DNA viruses ?

a) Poxviridae

b) Herpesviridae

c) Adenoviridae

d) Papovaviridae

Correct Answer - B

Ans. is 'b' i.e., Herpesviridae

DNA viruses

Poxviridae :- Variola, vaccinia, cowpox, monkeypox, tanapox, molluscum contagiosum
Herpesviridae :- HSV-1, HSV-2, varicella-zoster, EBV, CMV, HTLV- 1, RK-virus
Adenoviridae Adenovirus
Parvoviridae Parvovirus, Adenosatellovirus, Densovirus
Papovaviridae *Papilloma virus (HPV)*, Polyomavirus
Hepadnaviridae Hepatitis-B virus

184. C₁ esterase inhibitor deficiency causes ?

- a) Neisseria infection
- b) Hereditary angioneurotic edema
- c) Hemolytic disease
- d) Hemolytic uremic syndrome

Correct Answer - B

Ans. is 'b' i.e., Hereditary angioneurotic edema

Hereditary angioneurotic edema is due to C₁ inhibitor (C₁ esterase inhibitor) deficiency.

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185. Runt disease is ?

- a) Graft rejection
- b) Graft vs host disease
- c) Host vs graft disease
- d) Type III hypersensitivity

Correct Answer - B
Ans. is 'b' i.e., Graft vs host disease

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186. True about hydatid cyst are all, except ?

- a) Most common site is liver
- b) Calcification is common in lung
- c) May involve kidney
- d) Liver cysts are more common in right lobe

Correct Answer - B

Ans. is 'b' i.e., Calcification is common in lung

Hydatid disease

- Liver cysts
- *The majority of hydatid cysts occur in the liver, causing symptoms :*
- Chronic abdominal discomfort
- Palpable abdominal mass
- Allergic reactions due to cyst rupture - skin rash, anaphylactic shock, or death.
- Abscess formation due to secondary bacterial infection
- Liver cysts occur more frequently in the *right lobe*.

Lung cyst

- Second most common organ (after liver)
- Usually asymptomatic
- Occasionally may cause symptoms.
- Least common site of calcified hydatid cyst.

Radiographic signs

- 1. *Meniscus sign*
- 2. *Water - lily sign, camelote sign*
- 3. *Rising sun sign, serpent sign*
- 4. *Empty cyst sign*

187. Virulence factor for clostridium tetani ?

- a) Endotoxin
- b) Tetanolysin
- c) Tetanospasmin
- d) Bacteremia

Correct Answer - C

Ans. is 'c' i.e., Tetanospasmin

Pathogenicity of Cl tetani

- *Cl. tetani* has little invasive property and is confined to the primary site of lodgment. Tetanus results from the action of the potent exotoxin it produces.

Toxins of Cl tetani

- 1) Tetanolysin (Hemolysin)
- Not relevant in the pathogenesis of tetanus.
- 2) Tetanospasmin (neurotoxin)
- *Responsible for tetanus*
- It is plasmid coded
- In the brainstem and spinal cord it blocks release of the inhibitory neurotransmitter glycine and 'yaminobutyric acid (GABA).
- It resembles strychnine in its effects, but it acts presynaptically, while strychnine acts postsynaptically. o Tetanus toxin and botulinum toxin resemble each other in their aminoacid sequences.
- 3) Nonspasmogenic, peripherally active neurotoxin
- Its role is not known

188. Which myxovirus does not have hemagglutinin and neuraminidase but have membrane fusion protein -

a) Measles

b) Parainfluenza

c) RSV

d) Influenza

Correct Answer - C

Ans. is 'c' i.e., RSV

RSV does not possess hemagglutinin or neuraminidase.

The viral envelope has two glycoproteins?

i) *G protein* → By which virus attaches to cell surface

ii) *F- protein (Fusion protein)* → which bring about fusion between viral and host cell membranes. It is also responsible for cell to cell fusion, which leads to characteristic *syncytial formation*.

189. Which prion disease affect human ?

a) Scrapie

b) Madcow disease

c) Kuru

d) Bovine spongiform encephalopathy

Correct Answer - C

Kuru prion Infection through ritualistic cannibalism

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190. Peritrichous flagellae are seen in ?

a) Vibrio cholerae

b) Proteus

c) Campylobacter

d) Legionella

Correct Answer - B
Ans. is 'b' i.e., Proteus

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191. Molluscum contagiosum virus belongs to ?

a) Poxviruses

b) Herpesviruses

c) Picornaviruses

d) Adenovirus

Correct Answer - A
Ans. is 'a' i.e., Poxviruses

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192. True about vibrio vulnificus ?

a) Causes diarrhea commonly

b) Halophilic

c) Drug of choice is penicillin

d) Produces shiga toxin

Correct Answer - B

Ans. is 'b i.e., Halophilic

V. Vulnificus

- V. vulnificus is a *halophilic vibrio*. It has been linked to two distinct syndrome.

193. True about diphtheria toxin ?

- a) Heat stable
- b) Acts through cGMP
- c) Consists of three fragments
- d) Special affinity for brain

Correct Answer - A

Ans. is 'a' i.e., Heat stable

"Diphtheria toxin is a heat-stable polypeptide, composed of two fragments" - Medical microbiology

Diphtheria toxin

- The diphtheria toxin acts by inhibiting protein synthesis. It inhibits polypeptide chain elongation in the presence of nicotinamide adinine dinucleotide (NAD) by inactivating elongation factor, EF - 2.
- The diphtheria toxin is a protein which consists of two fragments, A and B.
- Both fragments are necessary for the toxic effect :
 - .. *Fragment A* - has enzymatic activity and inhibits protein synthesis by inhibiting the chain elongation by inactivating the elongation factor - 2 (Ef - 2)
 - .. *Fragment B* - responsible for binding the toxin to the cells.
- *Toxin has special affinity for certain tissues such as myocardium, adrenals and nerve endings.*
- The strain almost universally used for toxin production is the "*Park williams 8 strain*".

194. How does chlamydia differ from other usual bacteria?

- a) Lack cell wall
- b) Cannot grow in cell free culture media
- c) Contains inclusion body
- d) None of the above

Correct Answer - C

Ans. is 'c' i.e., Contains inclusion body

Chlamydia produces basophilic (intracytoplasmic) inclusion bodies in infected cells in contrast to eosinophilic inclusion bodies produced by most viruses and hence they are sometimes referred to as Basophilic viruses.

Unique properties of chlamydiae are

- Chlamydia is an *obligate intracellular parasite*. This means they can survive only by establishing residence inside animal cells
- They need their host's ATP as an energy source for their own cellular activity. They are energy parasites using a cell membrane transport system that uses ATP from the host system and gives out ADP.
- This obligate intracellular existence makes it impossible to culture these organisms on nonliving artificial media. Due to their small size and failure to grow in cell - free media they were considered to be viruses.
- Chlamydiae grows in cultures of a variety of eukaryotic cell lines McCoy or HeLa cells. It may be necessary to treat cells with polyanionic compounds such as DEAD-dextran to reduce the electrostatic barrier to infection. Antimetabolite such as cycloheximide is added to favour competition for host cell amino acid pools. All types of

chlamydiae proliferate in embryonated eggs particularly in the yolk sac.

- The special features in structure and chemical composition of chlamydiae are:
 1. The outer cell wall resembles the cell wall of gram negative bacteria
 2. It has a relatively high lipid content
 3. It is rigid but it does not contain typical bacterial peptidoglycan; perhaps it contains a tetrapeptide linked matrix.
 4. N Acetylmuramic acid also appears to be absent from chlamydiae cell wall.

195. A patient is suffering from pneumonia. Laboratory study shows acid-fast filamentous bacterium. The causative organism is ?

a) M. tuberculosis

b) Actinomyces

c) Nocardia

d) Mycobacterium Avium intracellulare

Correct Answer - C

Ans. is 'c' i.e., Nocardia

Symptoms of pneumonia by a filamentous acid fast bacterium suggest the diagnosis of Nocardia.

196. Mycobacterium tuberculosis grows in LJ media in?

a) 10-14 days

b) 2-3 weeks

c) 4-8 weeks

d) > 10 weeks

Correct Answer - C

Ans. is 'c' i.e., 4-8 weeks

- M tuberculosis produces visible colonies on solid media (L.J. media) in 4-8 weeks
- Use of liquid media with radiometric growth detection (BACTEC-460) and the identification of isolates by *nucleic acid probes* give result in 2-3 weeks.

197. Which of the following is an example of heterophile antibody test ?

- a) Widal test
- b) Weil-Felix reaction
- c) Rose-waler test
- d) Blood grouping & cross matching

Correct Answer - B

Ans. is 'b' i.e., Weil-Felix reaction

Heterophilic agglutination reaction

- Some organisms of different class or species share closely related antigens.
- When serum containing agglutinin (antibody) of one organism gives agglutination reaction with antigen of other organism, it is called heterophilic agglutination test.

Examples are

- *Streptococcus M.G. agglutination test for primary atypical pneumonia.*
- *Weil - Felix reaction for typhus fever.*
- *Paul Bunnell test for IM1V.*

198. All cause viral hepatitis except -

a) Measles

b) EBV

c) Rhinovirus

d) Reovirus

Correct Answer - C

Ans. is 'c' i.e., Rhinovirus

Important viruses causing hepatitis:?

1) *Hepatotropic viruses* : HAV, HBV, HCV, HD V, HEV.

2) *Herpes viruses* : CMV, EBV, HSV-1, VZV.

3) *Flaviviruses* : Yellow fever, dengue fever.

4) *Filoviruses* : Marburg virus, Ebola virus.

5) *Occasional causes Measles virus*, adenovirus, Echoviruses, Coxsackieviruses, influenza virus, parvoviruses, *reoviruses*, mumps virus.

199. Shiga toxin acts by ?

- a) Activating adenylyl cyclase to increase cAMP
- b) Activating guanylyl cyclase to increase cGMP
- c) Inhibiting protein synthesis
- d) Inhibiting DNA replication

Correct Answer - C

Ans. is 'c' i.e., Inhibiting protein synthesis

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200. Enrichment media for cholera ?

a) VR medium

b) TCBS medium

c) Cary-Blair medium

d) Alkaline peptone water

Correct Answer - D

Ans. is 'd' i.e., Alkaline peptone water

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201. True about vibrio parahemolyticus ?

- a) Polar flagella
- b) Non halophilic vibrio
- c) Non-capsulated
- d) Requires NaCl

Correct Answer - D

Ans. is 'd' i.e., Requires NaCl

It is halophilic vibrio.

- * Inhabits the coastal sea, where it is found in fish and shellfishes such as shrimps and crabs and molluscs such as oyster.
- * It resembles the cholera vibrio except that:
 - > It is capsulated.
 - > Shows bipolar staining
- * Produces peritrichous flagella when grown on solid medium (V. cholerae has polar flagella), in liquid medium polar flagella are formed.
- * It grows, only in media containing NaCl, optimum conc. is 2-4 %, Its enteropathogenicity is closely linked to its ability to cause hemolysis on Wagatsuma agar and the Kanagawa phenomenon.

202. Selective medium for shigella ?

a) Chocolate agar

b) BYCE medium

c) Hektoen agar

d) EMJH medium

Correct Answer - C

Ans. is 'c' i.e., Hektoen agar

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203. Sterilization is defined as ?

- a) Disinfection of skin
- b) Complete destruction of all microorganisms
- c) Destruction of pathogenic organisms
- d) Decrease bacterial count from objects

Correct Answer - B

Ans. is 'b' i.e., Complete destruction of all microorganisms
Sterilization

- The process by which an article surface or medium is freed of all living microorganisms either in the vegetative or spore state
Complete absence of microorganism.

Disinfection

- Destruction or removal of all *pathogenic organisms* capable of giving rise to infection *reduction in the microorganisms to such a level which is deemed no longer harmful to health.*
- **Unlike sterilization, disinfection is not sporicidal (does not kill spores).**

Decontamination

- The process of *rendering of an article or area free of danger from contaminants, including microbial, chemical, radioactive and other hazards.*

Antisepsis

- It is defined as "Prevention of infection, usually by inhibiting the growth of bacteria in wound or tissues".

Antiseptics

- **Chemical disinfectants** which can be *safely applied to skin or mucous membrane* are called **antiseptics** or **skin disinfectant**.
- **Best and most commonly used antiseptic is povidone iodine**

(betadine). Commonly used skin disinfectants for hand washing are *povidone iodine (betadine)*, *chlorhexidine* and *isopropyl alcohol*.

Disinfectants

- Antimicrobials applied only to **inanimate object**. They are **not used for surface disinfection**(^{A-9}) (skin or mucous membrane).

Germicides

- These include both **antiseptics and disinfectant**.

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204. True about endotoxin ?

a) Protein

b) Highly antigenic

c) No enzymatic activity

d) Produced by gram positive bacteria

Correct Answer - C

Ans. is 'c' i.e., No enzymatic activity

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205. A 17 years old female presents with sore throat, lymphadenopathy and positive heterophile antibodies test. Diagnosis is ?

a) Tuberculosis

b) Streptococcal pharyngitis

c) Infectious mononucleosis

d) Cytomegalic inclusion disease

Correct Answer - C

Ans. is 'c' i.e., Infectious mononucleosis

Laboratory diagnosis

In IMN, there is predominantly lymphocytosis with presence of 20% or more atypical lymphocytes. These atypical lymphocytes are activated T-lymphocytes which have round or irregularly shaped nuclei, with abundant flowing cytoplasm that characteristically has a dark-staining periphery.

206. Lethal effect of dry heat is due to ?

- a) Denaturation of proteins
- b) Oxidative damage
- c) Toxicity due to metabolites
- d) All of the above

Correct Answer - D

Ans. is 'd' i.e., All of the above

HEAT STERILIZATION

Heat is the most reliable method of sterilisation and should be the method of choice unless contraindicated. • Sterilization by heat is of two types.

Dry heat

Killing effect is due to protein denaturation, oxidative damage and the toxic effect of elevated metabolites.

207. PLET medium is used in ?

a) Plague

b) Anthrax

c) Typhoid

d) Cholera

Correct Answer - B

Ans. is 'b' i.e., Anthrax

Selective *media* for *B. anthracis* is PLET medium, consisting of polymyxin, lysozyme, ethylene diamine tetraacetic acid (EDTA) and thallos acetate added to heart infusion agar.

208. Tunica reaction is positive in ?

a) *R. prowazekii*

b) *R. typhi*

c) *R. tsutsugamushi*

d) *R. akari*

Correct Answer - B

Ans. is 'b' i.e., *R. typhi*

Neill - Mooser (Tunica) reaction

- When male guinea pigs are inoculated intraperitoneally with blood from a case of endemic typhus or with a culture of *R. typhi* (*R. mooseri*) they develop fever and a characteristic scrotal inflammation.
- This reaction is used to differentiate *R. typhi* and *R. prowazekii*.

209. Laproscope is sterilized by ?

a) 2% formalin

b) 2% glutaraldehyde

c) Autoclaving

d) Boiling

Correct Answer - B

Ans. is 'b' i.e., 2% glutaraldehyde

All endoscopes (e.g. laproscope) are sterilized by 2% glutaraldehyde (cidex).

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210. Suckling mice is used for isolation of ?

a) Cocksackie virus

b) Pox

c) Herpes

d) Adenovirus

Correct Answer - A

Ans. is 'a' i.e., Cocksackie virus

It is necessary to employ suckling mice for the isolation of coxsackie viruses.

Inoculation is usually made by intracerebral, subcutaneous and intraperitoneal route.

Adult mice are not susceptible.

211. Safety pin appearance is seen in ?

- a) *Vibrio vulnificus*
- b) *Vibrio parahaemolyticus*
- c) *Pseudomonas aeruginosa*
- d) *H. influenzae*

Correct Answer - B

Ans. is 'b' i.e., *Vibrio parahaemolyticus*

Bipolar staining (safety pin appearance)

- Some bacteria display a *safety pin appearance* due to the accumulation of dye at the poles of the cells.
- This characteristic is called *bipolar staining*.
- **Bacteria showing bipolar staining are?**
 - 1. *Calymmatobacter granulomatis* (*Donovani granulomatis*)
 - 2. *Vibrio parahaemolyticus*
 - 3. *Pseudomonas mallei*
 - 4. *Yersinia pestis*
 - 5. *Pseudomonas pseudomallei*
 - 6. *H. ducreyi*

212. Which anticoagulant is used when blood is sent for blood culture ?

a) Sodium citrate

b) EDTA

c) Oxalate

d) SPS

Correct Answer - D

Ans. is 'd' i.e., SPS

Many different types of bacteria and fungi have been identified as causative agents of septicemia.

For this reason, many diverse culture media formulations are available in prepared blood culture bottles.

Majority of these media contain 0.03% SPS (Sodium polyanethal sulfonate), a polyanionic anticoagulant, which additionally inhibits complement and lysozyme activity, interferes with phagocytosis and inactivates aminoglycosides.

Following important blood culture bottles are there :-

- i) Brain heart infusion (BHI) with PABA (para-aminobenzoic acid)
- ii) Brucella broth with 6% sorbitol
- iii) Brucella broth with 10% sucrose
- iv) Columbia broth
- v) Thioglycolate medium
- vi) Tryptic soy broth

213. Kanagawa's phenomenon is seen in ?

a) *Pseudomonera aeruginosa*

b) *Vibrio parahaemolyticus*

c) *Shigella sonnei*

d) *Proteus mirabilis*

Correct Answer - B

Ans. is 'b' i.e., *Vibrio parahaemolyticus*

Strains of *Vibrio parahaemolyticus* isolated from patients are always hemolytic on Wagatsuma agar, while strains from environmental sources are always non-hemolytic.

This linkage of enteropathogenicity to ability of hemolysis on Wagatsuma agar is called Kanagawa's phenomenon.

214. Which flavivirus causes hepatitis in human ?

a) Hepatitis A

b) Hepatitis B

c) Hepatitis C

d) Hepatitis D

Correct Answer - C
Ans. is 'c' i.e., Hepatitis C

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215. Syncytium formation is a property of ?

a) Herpes virus

b) Adenovirus

c) Measles virus

d) Rabies virus

Correct Answer - C
Ans. is 'c' i.e., Measles virus

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216. Babesiosis is transmitted by ?

a) Tick

b) Mites

c) Flea

d) Mosquito

Correct Answer - A

Ans. is 'a' i.e., Tick

Babesia

- Babesiosis is a protozoan disease caused by two species of Babesia : *Babesia microti* and *Babesia divergens*.
 - It is transmitted by *Ixodid tick*.
 - *Babesia* infects the RBCs and resides inside the RBCs (*intraerythrocytic*). Intraerythrocytic infection of Babesiosis is characterised by *maltese cross*. Maltese cross is a characteristic arrangement of parasites within the erythrocytes → *Parasites within erythrocytes are arranged such that pointed ends of four parasites come in contact thereby giving a tetrad configuration resembling a maltese cross*. Tetrad forms or 'Maltese cross' appearance is considered *pathognomic* of Babesiosis.
 - Clinically Babesiosis presents with chills, fever, mild hepatosplenomegaly, and mild hemolytic anemia. o Treatment includes *Atovaquone plus azithromycin* or *quinine plus clindamycin*.
 - Babesiosis can easily be confused with *P. falciparum* malaria.
 - **Following two features distinguish Babesiosis from malaria :?**
 - .. *Presence of maltese cross in Babesiosis (absent in malaria)*
 - ?. *Absence of pigment Hemozoin in Babesiosis (present in malaria)*
- Note** - Maltese cross is also seen in *cryptococcus* and *aspergillus*.

217. Pseudomonas exotoxin inhibits protein synthesis by inhibiting ?

a) RNA polymerase

b) EF-2

c) Transpeptidase

d) Reverse transcriptase

Correct Answer - B

Ans. is 'b' i.e., EF-2

Exotoxin 'A' of *P. aeruginosa* inhibits protein synthesis through interference with adenosine diphosphate ribosylation of elongation factor - 2.

Remember

- Bacterial toxins inhibiting protein synthesis :
- *Exotoxin A of P aeruginosa*
- *Shiga toxin (Shigella)*
- *Diphtheria toxin*
- *Shiga like toxin or verocytotoxin of EHEC.*

218. Triple iron sugar medium contains all, except ?

a) Lactose

b) Sucrose

c) Glucose

d) Maltose

Correct Answer - D

Ans. is d i.e., Maltose

Triple sugar iron agar is used for the differentiation of microorganisms on the basis of :?

- i. Fermentation of *dextrose (glucose), lactose and sucrose*.
- i. Production of H₂S.
- It is recommended for differentiation of enteric gram negative bacilli from clinical specimens, dairy samples and food products.
- **Contents of the medium are :?**
 - i. *Enzymatic digest of casein and animal tissue*.
 - i. Yeast enriched peptone.
 - i. *Three sugars : Dextrose (glucose), lactose and sucrose*.
 - r. Ferric ammonium citrate.
 - r. Sodium chloride.
 - i. Sodium thiosulfate.
 - i. Phenol red.
 - i. Agar.
- When carbohydrates are fermented, acid production is detected by the phenol red indicator, which is *yellow in acid and red in alkaline conditions*.
- Sodium thiosulfate is reduced to hydrogen sulfide (H₂S) and H₂S

reacts with an iron salt yielding typical black iron sulfide. *Ferric ammonium citrate is hydrogen sulfide indicator.*

Results

- Two areas of tube are examined : (i) Butt of the tube, and (ii) Slant of the tube.
- *An alkaline slant (red)- acid butt (yellow) indicates fermentation of dextrose (glucose) only → red /yellow. Examples are Proteus mirabilis, salmonella typhimurium and shigella flexneri.*
- *An acid slant (yellow) - acid butt (yellow) indicates fermentations of dextrose (glucose), lactose and/or sucrose → yellow/yellow. Example is E coli.*
- *An alkaline slant (red) - alkaline butt (red) indicates no fermentation (non-fermenter) → red/red. Example is Pseudomonas aeruginosa.*
- An alkaline precipitate in butt indicates H₂S production. It is produced by Proteus mirabilis and Salmonella typhimurium.

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219. Fastest method for diagnosis of TB -

a) Gene expert

b) LJ medium

c) TB MGIT

d) BAC, IEC

Correct Answer - A

Ans. is 'a' i.e., Gene expert

GeneXpert MTB/RIF

- The Xpert MTB/RIF detects DNA sequences specific for *Mycobacterium tuberculosis* and rifampicin resistance by polymerase chain reaction.
- It is based on the Cepheid GeneXpert system, a platform for rapid and simple-to-use nucleic acid amplification tests (NAAT).
- The Xpert MTB/RIF purifies and concentrates *Mycobacterium tuberculosis* bacilli from sputum samples, isolates genomic material from the captured bacteria by sonication and subsequently amplifies the genomic DNA by PCR.
- The process identifies all the clinically relevant rifampicin resistance inducing mutations in the RNA polymerase beta (*rpoB*) gene in the *mycobacterium tuberculosis* genome in a real time format using fluorescent probes called molecular beacons.
- Results are obtained from unprocessed sputum samples in 90 minutes, with minimal biohazard and very little technical training required to operate.

220. New York agar is used for ?

a) Salmonella

b) Clostridia

c) Neisseria

d) Bacillus Anthracis

Correct Answer - C

Ans. is 'c' i.e., Neisseria

New York City (NYC) medium is primarily designed for isolation of pathogenic Neisseria.

- It also supports the growth of genital mycoplasma (*Mycoplasma hominis* and *Ureoplasma Urealyticum*).
- It is useful in the diagnosis of gonorrhea and mycoplasma infection.
- It consists of primarily a peptone-corn starch agar-base buffered with phosphates and supplemented with horse plasma, horse hemoglobin, dextrose, yeast autolysate and antibiotics.

221. Acquire IgA deficiency may occur in ?

a) Severe Congenital toxoplasmosis

b) Severe Measles infection

c) Severe Brucellosis

d) Severe Leptospirosis

Correct Answer - A

Severe Congenital toxoplasmosis

- Block in B cell differentiation due to defective interaction between T and B cells. *Naive B cells are not able to differentiate into IgA - producing cells.*

222. Which of the following is a sexual spore ?

a) Chlamydospore

b) Sporangiospore

c) Ascospore

d) Phialoconidia

Correct Answer - C

Ans. is 'c' i.e., Ascospore

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223. True about Nipah virus are all except ?

- a) Is a paramyxovirus
- b) Causes hemorrhagic fever
- c) Emerging infection
- d) Present in India

Correct Answer - B

Ans. is 'b' i.e., Causes hemorrhagic fever

Nipah virus is an emerging infectious agent belongs to paramyxoviridae.

It was first isolated in Malaysia in 1998, causing encephalitis in domestic pigs, with direct transmission from pigs to human.

There have been Nipah virus infection outbreaks in pigs in Malaysia and Singapore and human disease in Malaysia, Singapore, India and Bangladesh.

Typically the human infection presents as an encephalitis syndrome marked by fever headache, drowsiness, disorientation, mental confusion, coma and death.

224. Defective hepatitis virus is ?

a) HAV

b) HBV

c) HCV

d) HDV

Correct Answer - D

Ans. is 'd' i.e., HDV

Hepatitis D (HDV) or Delta virus

- It is *defective* RNA virus dependent on the helper function of HBV for its replication and expression.
- It contains single stranded RNA (ssRNA) - Defective RNA.
- It has no independent existence and can survive and replicate only as long as HBV infection persists in the host.
- It resembles some plant viruses, such as *viroids or satellite viruses*.
- It has been classified in genus Deltavirus.
- Delta core of HDV is encapsidated by an outer envelope of HBs Ag, so it requires cooperative function of HBV.
- Intracellular replication of HDV RNA can occur without HBV but liver injury requires the presence of HBV.
- HDV can cause two types of infection.

225. The cystic form of all are seen in man except ?

a) E.histolytica

b) Giardia

c) Trichomonas

d) Toxoplasma

Correct Answer - C

Ans. is 'c' i.e., Trichomonas

Protozoal parasites have two phases.

Cystic phase

Trophozoite Cystic phase is not seen in :

- Trichomonas
- Entamoeba gingivalis
- Dientamoeba fragilis

226. Maternal mortality is more in ?

a) HAV

b) HBV

c) HCV

d) HEV

Correct Answer - D

Ans. is 'd' i.e., HEV

Hepatitis E virus

- Also known as enterically transmitted non-A non - B (NANB) virus or epidemic NANB.
- It is classified in the genus *Herpesvirus* under the family *caliciviridae*.
- It is a RNA virus with single - stranded positive sense RNA
- It is transmitted by fecal-oral route.
- *In India, HEV is responsible for the majority of epidemic and sporadic hepatitis in adults.*
- *An epidemiological feature that distinguishes HEV from other enteric agents is the rarity of secondary person to person transmission (Secondary attack rate is very low 2-3% as against 10-20 % in HAV infection)*
- *A unique feature is the clinical severity and high case fatality rate of 20-40 % in pregnant women, especially in the last trimester of pregnancy.*
- It is characteristically associated with cholestasis

227. Culture media used for 0157 : H7 Enterohemorrhagic E coli ?

- a) Sorbitol containing agar
- b) Mannitol containing agar
- c) Sucrose containing agar
- d) Dextrose containing agar

Correct Answer - A

Ans. is 'a' i.e., Sorbitol containing agar

Culture of 0157: H7 E.coli

- E.coli 0157:H7 is not identified on routine stool cultures.
- E.coli 0157:H7 can be specifically detected by the use of modified Mac Conkey media which contains sorbitol in place of lactose (SMAC).
- Sorbitol Mac Conkey media is specifically useful for the detection of E.coli 0157:H7 as unlike most strains of E. coli, the 0157: H7 strain does not ferment sorbitol.
- Non fermenting colonies on a Sorbitol Mac Conkey plate (SMAC) therefore suggest the diagnosis of E.coli 0157:H7.
- *Sorbitol Mac Conkey media is the screening method of choice for E.coli 0157:H7.*

228. Liquid medium for tuberculosis ?

- a) LJ medium
- b) Dorset medium
- c) Loeffler's medium
- d) MGIT

Correct Answer - D

Ans. is 'd' i.e., MGIT

Mycobacterial growth indicator tube (MGIT) is an automated liquid culture method. It contains 7 ml of modified Middlebrook 7 H9 Broth base.

229. Indicator used in MaConkey Agar ?

- a) Methylene blue
- b) Methyl red
- c) Neutral red
- d) Bromothymol blue

Correct Answer - C

Ans. is 'c' i.e., Neutral red

MacConkey agar is a selective medium for enteric gram negative bacilli.

It is used to differentiate lactose fermenting enteric bacilli from lactose non-fermenters.

Composition of MacConkey agar ?

- 1) *Enzymatic digest of gelatin, casein and animal tissue* : To provide nutrition.
- 2) *Lactose* : Fermentable carbohydrate.
- 3) *Bile salts* : Selective agent and inhibits gram positive organisms.
- 4) *Crystal violet* : Inhibits gram positive bacteria.
- 5) *Sodium chloride* : Supplies essential electrolytes and osmotic balance.
- 6) *Neutral red* : pH indicator (when lactose is fermented, the pH of medium decreases, changing color of neutral red to pink).
- 7) *Agar* : Solidifying agent.

230. Subterminal spores are seen in ?

a) *Cl perfringens*

b) *Cl tetani*

c) *Cl tertium*

d) None

Correct Answer - A

Ans. is 'a' i.e., *Cl perfringens*

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231. LGV (lymphogranuloma venerum) is caused by ?

- a) Treponema pallidum
- b) Chlamydia trachomatis
- c) Calymmatobacter granulomatosis
- d) H Ducreyi

Correct Answer - B

Ans. is 'b' i.e., Chlamydia trachomatis

- Lymphogranuloma venereum (LGV) is a long-term (chronic) infection of the lymphatic system.
- It is caused by any of 3 different types (serovars) of the bacteria Chlamydia trachomatis.
- The bacteria are spread by sexual contact. The infection is not caused by the same bacteria that cause genital [chlamydia](#).
- Chlamydia trachomatis causes eye (conjunctivitis, trachoma), respiratory (pneumonia), and genital tract (urethritis, lymphogranuloma venereum) infections.
- Diagnosis made with nucleic acid test for C trachomatis, LGV serovars diagnosed serologically.

232. Exanthema subitum is caused by ?

a) HHV-6

b) HHV-8

c) Parvovirus

d) Coxsackievirus

Correct Answer - A

Ans. is 'a' i.e., HHV-6

HHV-6 causes roseola infantum (also called exanthema subitum or sixth disease).

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233. Which is not parenterally transmitted

a) HAV

b) HBV

c) HCV

d) HDV

Correct Answer - A
Ans. is 'a' i.e., HAV

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234. True about cryptococcus are all except

a) Primarily infects lung

b) Urease negative

c) India-ink is used

d) All are true

Correct Answer - B

Ans. is 'b i.e., Urease negative

CRYPTOCOCCUS NEOFORMANS

- The only pathogenic yeast
- Four capsular serotypes - A, B, C and D
- It has *polysaccharide capsule*
- *Most infections in immunocompromized patients are caused by serotype A.*
- *Pigeon droppings* commonly contains *serotype A and D.*
- *Eucalyptus tree* contain *serotype B.*
- It is *urease positive.*

Mode of transmission

- By inhalation of the fungus into the lung (most common)
- Through skin or mucosa (some times).

235. Which vaccine can cause adverse effects in persons with allergy to egg ?

a) Measles

b) Rubella

c) Rabies

d) Mumps

Correct Answer - C

Ans. is 'c' i.e., Rabies

Duck embryo Vaccine has less neuromuscular complications, but can cause allergic reactions. Persons allergic to eggs, should not be given this vaccine.

Rabies Vaccine

- Rabies vaccines are fluid or dried preparation of fixed virus grown in the neural tissues of rabbits, sheep, goats, mice or rats or in embryonated ducks egg or in cell cultures.
- Inactivation of virus is commonly done by treatment with formalin or 13. Propiolactone (B.P.L.) o Antirabies vaccine fall into two main categories.

236. Salmonellae other than S typhi and S paratyphi cause ?

- a) Typhoid fever
- b) Enteric fever
- c) Gastroenteritis
- d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Gastroenteritis

SALMONELLOSIS

- Salmonellosis is referred to the infection caused by bacteria of genus *salmonella*.
- Salmonellosis is of two types?
 - 1. *Typhoidal Salmonellosis* caused by *S.typhi* and paratyphi 'A','B' and 'C' (has been explained, see previous explanations)
 - 2. *Non-typhoidal Salmonellosis*

Non-typhoidal Salmonellosis (NTS)

It is the *most common type of salmonellosis* (more common than typhoidal salmonellosis)

Common NTS species are?

- i. *S. enteritidis*
- i. *S. heidelberg*
- i. *S. hadar*
- i. *S. typhimurium*
- i. *S. newport*

Unlike typhoid salmonella (S. typhi and S. paratyphi), where only reservoir is humans; non-typhoidal salmonella can be acquired from multiple animal reservoirs.

Transmission is most commonly associated with?

- i. *Animal food products especially eggs, poultry, undercooked meat*
- i. *Dairy products*
- i. *Fresh produce contaminated with animal waste*

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237. Optimal percentage of NaCl for V cholerae ?

a) 1%

b) 2%

c) 3%

d) 4%

Correct Answer - A

Ans. is 'a' i.e., 1%

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238. Waterhouse-Friderichsen syndrome is seen in ?

a) Pneumococci

b) N. meningitidis

c) Pseudomonas

d) Yersinia

Correct Answer - B

Ans. is 'b' i.e., N. meningitidis

Waterhouse–Friderichsen syndrome (WFS) is defined as adrenal gland failure due to **bleeding** into the **adrenal glands**, commonly caused by a severe bacterial **infection**. Typically, it is caused by **Neisseria meningitides**. The bacterial **infection** leads to massive **bleeding** into one or (usually) both **adrenal glands**.

- Fulminant meningococcemia (purpura fulminans or Waterhouse - Friderichsen syndrome) is the most rapidly lethal form of septic shock experienced by humans.
- It differs from most other forms of septic shock by the prominence of hemorrhagic skin lesions (petechiae, purpura) and the consistent development of DIC.

239. Causative organism of SARS

a) H₁N₁,

b) Corona virus

c) Rotavirus

d) RSV

Correct Answer - B

Ans. is 'b' i.e., Corona virus

Severe acute respiratory syndrome

- In November 2002, China experienced an outbreak of an unusual respiratory infection with many deaths
- Severe acute respiratory syndrome (SARS). o It is caused by *Corona virus type – 4*.
- SARS spreads by inhalation of the virus present in droplets or aerosols of respiratory secretions of patients.
- Fecal aerosols may also be infectious. o Incubation period is less than 10 days.

240. Weil felix reaction is heterophile antibodies reaction due sharing of Rickettsial antigen with

a) Shigella

b) Proteus

c) Chlamydia

d) Mycoplasma

Correct Answer - B

Ans. is 'b' i.e., Proteus

Weil felix reaction

- This reaction is an *agglutination test* in which sera are tested for agglutinins to O antigens of certain nonmotile *proteus strains* OX -19, OX - 2 and OX - K.
- The basis of the test is the sharing of an alkali - stable carbohydrate antigen by some rickettsiae and by certain strains of proteus, P. vulgaris OX - 19 and OX - 2 and P. mirabilis OX - K.
- The test is usually done as a tube agglutination, though rapid slide agglutination methods have been employed for screening

241. Neutrilization test is

a) Widal test

b) Weil-Felix test

c) Paul Bunnell test

d) Nagler reaction

Correct Answer - D

Ans. is 'd' i.e., Nagler reaction

Neutralization reaction

- When antibody reacts with a toxin or other biologically active antigen, it may neutralize the effect of toxin or antigen.
- This ability to used in neutralization test.
- Neutralization tests are of two types

242. Mode of transmission of Listeria

a) Ingestion

b) Inhalation

c) Skin inoculation

d) None

Correct Answer - A

Ans. is 'a' i.e., Ingestion

LISTERIOSIS

Mode of transmission;

- Foodborne → Most common (most cases are due to serotype 4b)
- Nosocomial → In late-onset neonatal infection.
- *L. monocytogenes* enters the body through the gastrointestinal tract after ingestion of contaminated foods such as cheese, fruit, or vegetables.
- The organism has several adhesion proteins (Ami (an autolysin amidase), Fbp A (fibronectin binding protein), and flagellin proteins) that facilitate bacterial binding to the host cells and that contribute to virulence.
- Iron is an important virulence factor. *Listeria* produces siderophores and is able to obtain iron from transferrin.

243. Frisch bacillus affects most commonly

a) Mouth

b) Nose

c) Eye

d) Ear

Correct Answer - B

Ans. is 'b' i.e., Nose

- Frisch bacillus is *Klebsiella rhinoscleromatis*, which causes rhinoscleroma, a granulomatous disease of the nose.
- *K pneumoniae* subspecies *rhinoscleromatis* form rhinoscleroma, a destructive granuloma of the nose and pharynx.
- *Klebsiella granulomatis* (formerly *Calymmatobacterium granulomatis*) causes a chronic genital ulcerative disease, granuloma inguinale, an uncommon sexually transmitted disease

244. Scarlet fever is caused by

- a) Streptococcus agalactie
- b) Streptococcus pyogenes
- c) Streptococcus pneumoniae
- d) Streptococcus equisimilis

Correct Answer - B

Ans. is 'b' i.e., Streptococcus pyogenes

Infections caused by streptococcus pyogenes

- Scarlet fever consists of streptococcal pharyngitis, accompanied by a characteristic rash which has a tiny red pinpoint appearance with sand-paper like texture.
 - It occurs due to production of erythrogenic toxin
- Respiratory infections
- Sore throat is the most common of streptococcal disease. It may be localised as tonsillitis as in older children and adults or it may involve the pharynx more diffusely (pharyngitis) as in younger children. Otitis media.

245. E antigen (HBeAg) of hepatitis B virus is a product of which gene

a) S

b) C

c) p

d) x

Correct Answer - B

Ans. is 'b' i.e., C

Genes & gene products

- The genome of HBV is made of circular DNA, but it is unusual because the DNA is not fully double stranded --> one of the strands is incomplete and other is complete → *partially double stranded DNA*.
- There are four known genes encoded by genome → 'C' , 'X' , 'P' , 'S'.

246. Which type of pulmonary TB is most likely to give sputum positive ?

a) Fibronodular

b) Pleural effusion

c) Cavitory

d) None

Correct Answer - C

Ans. is 'c' i.e., Cavitory

Sputum smears are usually positive in patients with laryngeal TB, endobronchial TB and cavitory pulmonary TB" — Kelley 's

"Patients with cavitory pulmonary TB have high bacterial load in their sputum" — Internet

247. Most halophilic vibrio ?

a) *V cholerae*

b) *V vulnificus*

c) *V alginolyticus*

d) *V parahemolyticus*

Correct Answer - C

Ans. is 'c' i.e., *V alginolyticus*

V alginolyticus is most salt tolerant (most halophilic) species of vibrio.

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248. Bile esculin agar is used for ?

a) Group A streptococcus

b) Group B streptococcus

c) Group C streptococcus

d) Enterococcus

Correct Answer - D

Ans. is 'd' i.e., Enterococcus

Enterococcus

- Majority of the infections are caused by *E. faecalis* and *E. faecium*. Less frequently isolated species are *E. gallinarum*, *E. durans*, *E. hirae* and *E. avium*.
- Enterococci are *normal inhabitants of the large bowel of human adults*, although they usually make up < 1% of the culturable intestinal microflora.
- They are catalase negative (as all streptococci).
- **Their characteristic feature is that they can grow in presence of**
 - 1. 40% bile
 - 2. 6.5% Sodium chloride
 - 3. At pH 9.6
 - 4. At 45°C (relative heat resistant surviving 60°C for 30 minutes)
 - 5. In 0-1% methylene blue milk
- They hydrolyze esculin. They grow in presence of 40% bile and hydrolyze esculin → Bile esculin positive.
- They are PYR (Pyrrolidonyl Arylamidase) positive.
- They are usually *non-hemolytic (gamma-hemolytic)*, but some-times may show *alpha or beta hemolysis*.

249. Tachyzoites are seen in ?

- a) Toxoplasma
- b) Toxocara
- c) Pulmonary eosinophilia
- d) Ascaris

Correct Answer - A

Ans. is 'a' i.e., Toxoplasma

Toxoplasmosis is the disease caused by infection with the *obligate intracellular parasite* *Toxoplasma gondii*.

There are two distinct stages in the life cycle of T gondii :?

Nonfeline stage

- In this stage *tissue cysts (containing bradyzoites)* or *sporulated oocysts* are ingested by intermediate hosts (Human, mouse, sheep or pig).
- The cyst is rapidly digested by the acidic-pH gastric secretion releasing *bradyzoites* or *sporozoites*.
- These bradyzoites or sporozoites enter the small - intestinal epithelium and transform into rapidly dividing *tachyzoites (endozoites)*.
- *The tachyzoites can infect and replicate in all mammalian cells except red blood cells.*
- Tissue cysts containing many bradyzoite develop 7-10 days after systemic tachyzoite infection.
- These tissue cysts occur in a variety of host organs but persist principally within the *CNS* and *muscle*.

Feline stage (sexual stage)

- This stage takes place in the definitive host (cat)
- This cycle is associated with formation of oocysts, which are

excreted in cat feces.

- Mature oocysts contain 2 sporocysts, each with 4 sporozoites.
- The formation of tissue cysts in cats constitutes the other part of feline cycle.

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250. A patient presents with headache, high fever and meningismus. Within 3 days he becomes unconscious. Most probable causative agent ?

a) Naegleria fowleri

b) Acanthamoeba castellani

c) Entamoeba histolytica

d) Trypanosoma cruzi

Correct Answer - A

Ans. is 'a' i.e., Naegleria fowleri

Amongst the given options Naegleria and Acanthamoeba cause amoebic encephalitis.

"The prognosis of Naegleria encephalitis is uniformly poor, most patients die within a week".

"Acanthamoeba encephalitis follows a more indolent course".

251. DNA polymerase of HBV is encoded by which of the following ?

a) S gene

b) C gene

c) P gene

d) X gene

Correct Answer - C

Ans. is 'c' i.e., P gene

DNA polymerase of HBV is encoded by P gene

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252. Heat labile liquids are sterilized by ?

a) Hot air oven

b) Autoclaving

c) Membrane filter

d) Moist heat

Correct Answer - C

Ans. is 'c' i.e., Membrane filter

Filters are used to sterilize heat-labile solutions.

Membrane filters are used to sterilize pharmaceutical substances, ophthalmic solutions, liquid culture media, oils, antibiotics and other heat sensitive solutions.

253. Rideal-Walker coefficient is related with ?

- a) Disinfecting power
- b) Parasitic clearance
- c) Dietary requirement
- d) Statistical correlation

Correct Answer - A

Ans. is 'a' i.e., Disinfecting power

Traditional testing of disinfectants

Two traditional tests for determining the efficiency of disinfectants are :?

- 1) *Rideal-Walker test* : Phenol is taken as the standard with unit as phenol coefficient (phenol=1)
- 2) *Chick-Martin test* : The disinfectant acts in the presence of organic matter (dried yeast or feces).

254. A patient presents with fever. Peripheral smears shows band across the erythrocytes. Diagnosis is ?

a) P Falciparum

b) P vivax

c) P ovate

d) P malariae

Correct Answer - D

Ans. is 'd' i.e., P malariae

Band across erythrocytes (band-form trophozoites) is characteristic of P malariae.

255. Rash is not caused by ?

- a) Salmonella
- b) Shigella
- c) Meningococci
- d) Staphylococcus

Correct Answer - B

Ans. is 'b' i.e., Shigella

Salmonella (typhoid) and meningococci cause morbilliform rash.

Staphylococcus causes scarlentifform rash in TS S and SSSS.

Infections causing Exanthems (acute generalized rash)

Morbilliform

- **Viral** : Measles (rubeola), *rubella*, erythema infectiosum, EBV, CMV, adenovirus, echovirus, early HIV, coxasackie virus.
- **Bacterial** : Typhoid, Early secondary syphiis, Early rickettsia, Early meningocemia.

Scarlentifform

- Scarlet fever (streptococcus).
- Toxic shock syndrome.
- Staphylococcal scalded skin syndrome.

256. Owl eye intranuclear inclusion body is seen in ?

a) Herpes zoster

b) Herpes simplex

c) CMV

d) EBV

Correct Answer - C

Ans. is 'c' i.e., CMV

CYTOMEGALOVIRUS (CMV)

- Also known as *salivary gland virus*
- CMV is the *largest virus amongst herpes viruses*
- They are characterized by enlargement of infected cells (*cytomegalic cells*) and *intranuclear inclusions*.
- Intranuclear inclusion is eccentrically placed and is surrounded by a halo - *owl's eye appearance*
- *Once infected an individual carries CMV for life*
- *CMV is the most common organism causing intrauterine infection.*
- *CMV is the most common pathogen complicating organ transplantation.*

257. Parasites for which modified ZN stain is used ?

a) Isospora

b) Microsporidia

c) Plasmodium

d) Echinococcus

Correct Answer - A
Ans. is 'a' i.e., Isospora

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258. Most common complication of chicken-pox -

a) Bacterial infection

b) Meningitis

c) Pneumonia

d) Nephritis

Correct Answer - A

Ans. is 'a' i.e., Bacterial infection

Complications of chicken pox

- The most common infectious complication of varicella is secondary bacterial superinfection of the skin, which is usually caused by streptococcus pyogenes or Staphylococcus aureus.
- *The most common extracutaneous site of involvement in children is CNS.*
- *Varicella pneumonia is the most serious complication following chickenpox in adults.*

259. Man had uncooked meat at dinner 3 days back, Now presenting with diarrhea. Stool examination shows coma shaped organism with RBC and WBC. Causative organism is ?

a) *Vibrio cholerae*

b) *Shigella*

c) *Campylobacter jejuni*

d) *Yersinia enterocolitica*

Correct Answer - C

Ans. is 'c' i.e., *Campylobacter jejuni*

This is a case of dysentery (RBC in stools along with WBC).

Among the given options, 'b', 'c' and 'd' can cause dysentery. But, coma shaped organism is *Campylobacter jejuni*.

Based on the depth of intestinal invasion, there are different clinical manifestations of infection with organisms causing diarrhea:-

No cell invasion (noninflammatory)

- The bacteria bind to intestinal epithelial cells but do not enter the cell.
- Diarrhea is caused by the release of enterotoxins.
- Watery diarrhea with *no fecal leukocytes* and no systemic symptoms (e.g. fever) occurs.

Organisms are :

1. *V cholerae*
2. *Clostridium perfringens*
3. *Cryptosporidia*

1. Adenovirus
5. *ETEC*
6. *B. cereus*
7. Microsporidia
8. *Staph. aureus*
9. *Giardia*
10. Rotavirus

Invasion of the intestinal epithelial cells (Inflammatory)

- The organisms have virulence factors that allow binding and invasion into cells.
- Toxins may be then released that destroy the cell.
- The cell penetration results in a systemic immune response with fecal *leukocytes* as well as fever.
- The cell death results in *RBC leakage into the stool (dysentery)*.

260. E coli causing hemolytic uremic syndrome ?

- a) Enteropathogenic
- b) Enterotoxigenic
- c) Enteroinvasive
- d) Enterohemorrhagic

Correct Answer - D

Ans. is 'd' i.e., Enterohemorrhagic

SCHERICHIA COLI

- At least six distinct "pathotypes" of intestinal pathogenic E. coli exist :
- Enteropathogenic E. coli | Enteroadherent E. coli
- It causes diarrhoea in infants and children usually occurring as institutional out breaks.
- It does not produce enterotoxin, nor are they invasive. They adhere to the mucosa of small intestine and cause disruption of the brush border microvilli.
- These strains can be identified by their adhesion to HEP - 2 cells.
- Enterotoxigenic E. coli
- It causes traveller's diarrhoea [ETEC is the most common cause of traveller's diarrhea!.
- It produces enterotoxins. They can produce heat labile toxin (LT) or heat stable toxin or both.
- Toxin production alone may not lead to illness. The strain should first be able to adhere to intestinal mucosa. This adhesiveness is mediated by *fimbrial or colonisation factor antigen (CFA)*.

Enteroinvasive E. coli

- They themselves resemble shigella and their infection resembles

shigellosis (remember : shiga like toxin is elaborated by enterohemorrhagic E. coli).

- They produce mild diarrhoea to frank dysentery and occur in adult as well as in children.
- They have been termed enteroinvasive because they have the capacity to invade intestinal epithelial cells in vivo and penetrate HeLa or HEP - 2 cells in tissue culture.
- This ability of penetration is plasmid determined which codes for outer membrane antigens called the 'virulence marker antigen' (VMA). The detection of plasmid can be diagnostic.
- For laboratory diagnosis of EIEC, the *sereny test* used to be employed.
- These strains are *non motile, do not ferment lactose or ferment it late* with acid without producing any gas.

Enterohemorrhagic E. coli or verotoxigenic E. coli

- These strains produce verocytotoxin (VT) or shiga like toxin (SLT)
- They can cause mild diarrhoea to fatal hemorrhagic colitis.
- Shiga like toxin belongs to class ribosome inactivating proteins (RIPs). It inhibits protein synthesis by inhibiting ribosomal function.
- This toxin also acts on vascular endothelium to promote the synthesis of coagulation factor VIII, vWF -* Platelet aggregation.
- They can cause hemolytic uremic syndrome particularly in young children and the elderly.
- O 157 : H 7 is the most prominent serotype of EHEC, associated with HUS, but 06, 026, 055, 091, 0103, 0111, 0113 and OX3 have also been associated with this syndrome.
- The primary target for VT is vascular endothelium.
- The typical EHEC is serotype 0157: H7 which does not ferment sorbital unlike majority of E. coli (but Harrison writes that few species of this serotype can ferment sorbital).
- Some other serotype like 026 : H1 also belongs to this group.
- Laboratory diagnosis of VIEC diarrhea is established by demonstration of the bacilli or VT in feces directly or in culture.

261. KOH wet mount is prepared for ?

a) Herpes Zoster

b) Candida

c) Gonorrhea

d) Trichomonas vaginalis

Correct Answer - B
Ans. is 'b' i.e., Candida

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262. Oncogenic DNA virus is ?

a) Retrovirus

b) HBV

c) HIV

d) HTLV

Correct Answer - B
Ans. is 'b' i.e., HBV

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263. Band form of P malariae is ?

a) Schizont stage

b) Trophozoite stage

c) Merozoite stage

d) Gametocyte stage

Correct Answer - B

Ans. is 'b' i.e., Trophozoite stage

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264. Bifringence polarization microscopy is used for ?

a) Flagella

b) Intracellular structures

c) Capsule

d) Spores

Correct Answer - B

Ans. is 'b' i.e., Intracellular structures

Polarization microscope enables the study of intracellular structure using differences in bifringence.

265. Most common cause of infection due to catheter in urinary tract ?

- a) E coli
- b) Coagulase negative staphylococci
- c) Staph aureus
- d) Pseudomonas

Correct Answer - A

Ans. is 'a' i.e., E coli

"E coli cause 80% of acute UTI in patients without catheterization".

"E. coli is the most common cause of catheter associated UTI too".

266. Which of the following fungi is/are difficult to isolate culture ?

a) Candida

b) Dermatophytes

c) Cryptococcus

d) Malassezia furfur

Correct Answer - D

Ans. is 'D' i.e., Malassezia furfur

Malassezia furfur does not grow on regular sabouraud's medium.

It requires complex media to grow

M. furfur is a *lipid dependent fungus* and 1% emulsified olive oil is added to sabouraud medium for its cultivation

Two media are now widely employed for all malassezia species.

.. Dixon medium

.. Modified dixon medium

267. Window period in HIV infection ?

a) 1-2 weeks

b) 4-8 weeks

c) 8-12 weeks

d) > 12 weeks

Correct Answer - B

Ans. is 'b' i.e., 4-8 weeks

Window period

- It takes 2-8 weeks to months for antibodies to appear after infection. This period, from *infection to appearance of antibodies*, is called as *window period*.
- During this period patients is seronegative i.e. serological tests (ELISA and Western blot) are negative. o The individual may be highly infectious during this period.

268. Thermophile bacteria grow at ?

a) 20°C

b) 20-40° C

c) 40-60°C

d) 60-80°C

Correct Answer - D

Ans. is 'd' i.e., 60-80° C

Temperature requirement of bacteria

- Bacteria vary in their requirements of temperature for growth.
- 1. Psychrophilic bacteria grow best at temperature below 20°C
- 2. Thermophilic bacteria grow best between 55-80°C
- 3. Mesophilic bacteria grow best between 25-40°C

269. Which of the following is not a pox virus?

a) Cow pox

b) Molluscum contagiosum

c) Small pox

d) Chicken pox

Correct Answer - D

Ans. is 'd' i.e., Chicken pox

Poxviruses causing disease in humans

- Variola (small pox)
- Buffalopox
- Cowpox
- Molluscum contagiosum
- Vaccinia
- Monkeypox
- Orf
- Tanapox

Chicken pox is caused by varicella - zoster virus, which is a herpes virus.

270. Metachromatic granules are seen in ?

a) *Gardenella vaginalis*

b) *Corynebacteria*

c) *Argobacterim*

d) All of the above

Correct Answer - D

Ans. is 'd' i.e., All of the above

Polymetaphosphate / volutin granules

- Some bacteria contain granules composed of polymetaphosphate. They were first described in *Spirillum volutans*, so they were called as *Volutin granules*.
- These granules are also known as *Babes Ernst granules* or *polar bodies* or *metachromatic granules*.
- These granules stain *reddish violet with methylene blue or toluidine blue*.
- These granules are strongly *basophilic*.
- In the granules, there is stored phosphate in the form of linear chains of inorganic phosphate. These granules represent *intracellular phosphate* reserve when nucleic acid synthesis does not occur.
- The phosphate is incorporated into nucleic acid during the synthesis of the latter.
- When nucleic acid synthesis is prevented by starvation, the granules accumulate in the cytoplasm. So, volutin metachromatic granules are most frequent in cells grown under conditions of nutritional deficiency (starvation) and tend to disappear when the deficient nutrients are supplied.
- Volutin metachromatic granules are common in -

- i. *Corynebacteria diptheriae*
- i. *Gardenella vaginalis*
- i. *Agrobacterim tumefaciens*
- i. *Mycobacteria*
- i. *Spirillum voluants*

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271. Which of the following is incubated at temperature 40-44 degrees ?

- a) Vibrio cholerae
- b) Pseudomonas aeruginosa
- c) Vibrio parahemolyticus
- d) E coli

Correct Answer - B

Ans. is 'b' i.e., Pseudomonas aeruginosa

"The optimum temperature for growth of pseudomonas aeruginosa is 37 degree and is able to grow at temperature as high as 42° C" -

Essentials of Microbiology

Pseudomonas aeruginosa

Morphology

- Gram negative bacilli
- **Motile by polar flagellum**
- Non capsulated but many strains have **mucoïd slim layer especially the organisms which are isolated from cystic fibrosis patient.**

Culture

- **Obligate aerobe**
- Colonies emit a distinctive, musty, mawkish, earthy or **sweet grape-like odour or corn tocolike odour.**
- **Cetrimide agar is a selective media.**
- Pseudomonas aeruginosa produces a numbers of pigments. The production of these pigments accounts for the colour of colonies.
- *Pyocyanin is produced only by P.aeruginosa and it inhibits the growth of many other bacteria.*
- Pyoverdin may be produced by many other species.

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272. Transmission of cholera is through ?

- a) Fecally contaminated food
- b) Fecally contaminated water
- c) Contaminated food by vomits of a case
- d) All of the above

Correct Answer - D

Man is the only reservoir. The immediate source of infection are the stools and vomits of cases and carrier. Infection is acquired through fecally contaminated water or food. Chlorination of water is effective against V cholerae.

There are following types of carrier in cholera.

- i) *Incubatory* : Shed vibrios only in the brief incubation period of 1-5 days.
- ii) *Convalescent* : Shed vibrios for 2-3 weeks.
- iii) *Healthy or contact carrier* : Has had subclinical infection and shed vibrios for less than 10 days.
- iv) *Chronic carriers* : Can shed vibrios for months or years and may have persistent infection in gall bladder.

273. Reservoir of plague is ?

a) Domestic rat

b) Wild rat

c) Rat flea

d) Man

Correct Answer - B
Ans. is 'b' i.e., Wild rat

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274. IgE binds to which cell ?

a) T cells

b) B cells

c) Mast cells

d) NK cells

Correct Answer - C

IgE binds to Mast cells and basophils, and mediate Type I hypersensitivity.

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275. Wrong statement about chicken pox/ herpes zoster?

- a) Caused by VZV
- b) Chicken-pox primary infection
- c) Herpes-zoster recurrent infection
- d) Latent infection in trigeminal ganglion

Correct Answer - C

Ans. is 'c' i.e., Herpes-Zoster recurrent infection

Herpes-Zoster is due to reactivation of latent infection (not due to recurrent infection). Other options are correct.

276. Sterols are found in ?

- a) Cell wall of Rickettsia
- b) Cell membrane of Rickettsia
- c) Cell wall of Mycoplasma
- d) Cell membrane of Mycoplasma

Correct Answer - D

Ans. is 'd' i.e., Cell membrane of Mycoplasma

Mycoplasma lack cell wall. They are bounded by *triple layered unit membrane that contains sterol*. o Thus they require cholesterol and related sterols.

277. Double zone of hemolysis is seen in ?

- a) Staphylococcus aureus
- b) Streptococcus pyogenes
- c) Clostridium perfringens
- d) Corynebacterium diphtheriae

Correct Answer - C

Ans. is 'c' i.e., Clostridium perfringens

Two important characteristic feature of Cl. perfringens are :?

1. Target hemolysis (double zone hemolysis) on blood agar. *It is a narrow zone of complete hemolysis by theta toxin which is surrounded by a wider incomplete hemolysis by alpha-toxin.*
2. Naegler's reaction detects alpha toxin (phospholipase or lecithinase C). When CL. perfringens is grown on a medium with the antitoxin spread on one half of the plate, colonies on the other half without the antitoxin will be surrounded by a zone of opacity. There will be no opacity around the colonies on the half of the plate with the antitoxin, due to the specific neutralisation of the alpha-toxin.

278. Mechanism action of botulinum toxin ?

- a) Increased cAMP
- b) Increased cGMP
- c) Inhibition of acetylcholine release
- d) Inhibition of noradrenaline release

Correct Answer - C

Ans. is 'c' i.e., Inhibition of acetylcholine release

Botulinum Toxin

- Cl. botulinum produces a powerful exotoxin that is responsible for its pathogenicity.
- *The toxin differs from other exotoxins in that it is not released during the life of organism. It is produced intracellularly and appears in the medium only on the death and autolysis of the cell.*
- It is the most toxic substance known.
- Toxin is heat labile, but spores are highly heat resistant.
- It acts by blocking the release of acetylcholine at synapses and neuromuscular junction. It acts presynaptically.
- *Toxin of all types (A, B, C, D, E, F, G) are neurotoxin except C2 which is a cytotoxin (enterotoxin).*

279. Serum marker after Hepatitis B vaccination ?

a) Anti-HBsAg

b) Anti-HBeAg

c) Anti-HBcAg

d) HBsAg

Correct Answer - A

Ans. is 'a' i.e., Anti-HBsAg

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280. Double stranded RNA virus with segmented genome?

a) Influenza

b) Rotavirus

c) Arenavirus

d) Bunyavirus

Correct Answer - B
Ans. is 'b' i.e., Rotavirus

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281. Culture medium for campylobacter jejuni ?

a) BYCE medium

b) Skirrow's medium

c) Thayer-Martin medium

d) TCBS medium

Correct Answer - B

Ans. is 'b' i.e., Skirrow's medium

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282. All are true about candida except ?

- a) Pseudohyphae seen
- b) Produce chlamydospore
- c) It is a mould
- d) It is a dimorphic fungus

Correct Answer - C

Ans. is 'c' i.e., It is a mould

Candida

- Candida is a yeast like fungus (not mould).
- *Candida albicans* is the most common cause of mucosal candidiasis.
- All candida species pathogenic for humans are also encountered as *commensals* of humans, particularly in the mouth, *stool* and vagina.
- They grow rapidly on simple media as oval budding cells at 25° to 37°C.
- In tissue, both yeasts and *pseudohyphae* are present.
- Candida albicans is differentiated by other candida :
- It forms *true hyphae* (mycelia) or germ tubes when grown in serum.
- It forms thick walled large spores called *chlamydospores* when grown in corn meal agar.
- It is *dimorphic*.

Remember → *Candida albicans* can produce yeast, *true hyphae* and *pseudohyphae*.

- A rapid method of identifying *C. albicans* is based on its ability to form germ tubes within two hours when incubated in human serum at 37°C Reynolds - Braude phenomenon (Also known as germ tube test)

283. Intermediate host for guinea worm ?

a) Fish

b) Man

c) Cyclops

d) Crab

Correct Answer - C
Ans. is 'c' i.e., Cyclops

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284. Which of the following hepatitis viruses is a DNA virus ?

a) Hepatitis C virus

b) Hepatitis B virus

c) Delta agent

d) Hepatitis E virus

Correct Answer - B

Ans. is 'b' i.e., Hepatitis B virus

Hepatitis B virus (HBV)

- Hepatitis B virus is the most widespread virus and the most important cause of viral hepatitis. o HBV belongs to Hepadna viridae
- HBV is *hepadnavirus type -1*
- Hepatitis B is the only hepatitis virus which has DNA. All others are RNA viruses.
- HBV contains two linear strands of DNA. One of the strands (the plus strand) is incomplete and other is complete (the minus strand) → *Partially double stranded DNA*.
- HBV contains both *DNA-dependent DNA polymerase and RNA dependent reverse transcriptase*.
- *Instead of DNA replication directly from a DNA template, **HBV** relies on reverse transcription of minus strand DNA from a pregenomic RNA intermediate (like retrovirus).*

285. Most common Nosocomial infection ?

a) Pneumonia

b) UTI

c) Surgical wound infection

d) Nephritis

Correct Answer - B

Ans. is 'b' i.e., UTI

Most common nosocomial infection → Urinary tract infection.

Most of the nosocomial UTIs occur after urinary *catheterization*.

Second most common nosocomial infection → Pneumonia.

Most of the nosocomial pneumonias are acquire *through respiratory intubation, mechanical ventilation* and suction of the material from mouth.

286. Method used for acid fast staining ?

- a) Robertson's method
- b) Ziehl Neelsen
- c) Silver imprignation method
- d) Dark ground illumination

Correct Answer - B

Ans. is 'b' i.e., Ziehl Neelsen

Acid fast staining

- After staining with aniline dye, acid fast organisms resist decolourisation with acids.
- Method most commonly used is modified *Ziehl Neelsen*.

287. Paralysis in polio is characterized by ?

- a) Spasticity
- b) Symmetrical
- c) LMN type
- d) Progressive

Correct Answer - C

Ans. is 'c' i.e., LMN type

Clinical manifestations of polio

- **Incubation period ranges from 3-35 days (usually 7-14 days).**
The clinical spectrum includes :-
 1. *Subclinical (inapparent) infections (95%) : Most common and play predominant role in spread of infection.*
 2. *Minor (abortive) illness (4-8%) : Present with fever, sore throat, headache and malaise.*
 3. *Aseptic meningitis/ non paralytic polio (1%) : There are signs and symptoms of meningitis.*
 4. *Paralytic polio (There is flaccid paralysis with absent reflexes. Respiratory paralysis is the most common cause of death.*

288. Drug resistance in Tuberculosis is due to ?

a) Transformation

b) Transduction

c) Conjugation

d) Mutation

Correct Answer - D
Ans. is 'd' i.e., Mutation

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289. All selective media are correctly matched except ?

- a) V cholerae - TCBS medium
- b) Pseudomonas - Cetrimide agar
- c) M tuberculosis - LJ medium
- d) Campylobacter - BCYE medium

Correct Answer - D

Ans. is 'd' i.e., Campylobacter - BCYE medium

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290. Not true about *Histoplasma capsulatum* ?

- a) Dimorphic fungus
- b) May mimic TB
- c) Capsulated
- d) Mostly asymptomatic

Correct Answer - C

**Ans. is 'c' i.e., Capsulated
*Histoplasma capsulatum***

- *A dimorphic fungus*
- *Non encapsulated → The only medically important capsulated fungus is cryptococcus.*
- *Infection is acquired by inhalation of microconidia (small spores) in dust contaminated with bird or bat dropping.*
- *It causes intracellular infection of reticuloendothelial system.*
- *Clinical manifestations → Majority of patients are asymptomatic*

291. Schizont are not seen in peripheral blood of which malarial parasites ?

a) P vivax

b) P falciparum

c) P ovale

d) P malariae

Correct Answer - B

Ans. is 'b' i.e., P falciparum

In peripheral smear of falciparum malaria following forms are seen

- Early ring form
- Gametocytes

Mature trophozoites and schizont are not found in peripheral blood because schizogony occurs inside the capillary of internal organs (spleen, liver and bone marrow).

292. Super carrier of HBV shows following serum markers ?

a) HBsAg

b) HbsAg + HBV DNA

c) HbsAg + HBeAg + HBV DNA

d) Anti-HBsAg + HBV DNA

Correct Answer - C

Ans. is 'c' i.e., HbsAg + HBeAg + HBV DNA

- In HBV infection, there are two types of carriers :
Super Carriers
- High titre of HBs Ag, HBe Ag, DNA polymerase and HBV in the circulation
- Highly infective
- **Simple carriers**
- Low titre of HBsAg with negative HBe Ag, DNA polymerase and HBV
- Have low infectivity

293. Cold sterilization is ?

- a) Sterilization by negative temperature
- b) Sterilization by ionizing radiation
- c) Sterilization by liquid CO₂
- d) Sterilization by non-ionizing radiation

Correct Answer - B

Ans. is 'b' i.e., Sterilization by ionizing radiation

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294. Best specimen for anaerobic culture ?

a) Exudates from wound

b) Pus aspirated in vial

c) Swab from wound

d) Mid-stream urine

Correct Answer - B

Ans. is 'b' i.e., PUS aspirated in vial

- Ideal specimens for anaerobic cultures are *samples of needle aspirates and proper tissue specimens*. Anaerobic swabs are usually discouraged.

Important specimens are :-

- i. *Local abscess : Needle aspirates.*
- i. *Pulmonary : Transtracheal aspirates, lung aspirates, pleural fluid, protected bronchial wash.*
- i. *Abdominal : Abdominal abscess aspirate.*
- i. *Urinary tract : Suprapubic bladder aspirate.*
- i. *Genital tract : Culdocentesis specimen, endometrial swabs.*
- i. *CNS : CSF, Aspirate of abscess.*

Aspirated material then injected into one of the following :?

- i. *Anaerobic swab*
- i. *Thioglycollate enrichment broth*
- i. *Oxygen free vials*
- Exudates, swabs from burns, wound and skin abscesses are generally unacceptable for anaerobic culture. Cysts and abscess are contaminated with normal anaerobic flora.
- Voided and catheterized urine are contaminated with distal urethral anaerobes and are therefore unacceptable for anaerobic culture.

295. Aerobic blood culture should be incubated for how many days, before discarding ?

a) 2 days

b) 5 days

c) 10 days

d) 14 days

Correct Answer - D

Ans. is 'd' i.e., 14 days

- Blood specimens of 5 or 10 ml generally are added to bottles containing, 50 or 100 ml of reagent (medium) to achieve a 1:10 blood medium ratio.
- All bottles should be transported to the laboratory as soon as possible and immediately incubated at $35 \pm 2^{\circ}\text{C}$ in an upright position (Note - Lower incubation temperature may be preferred for isolation of some specific bacteria, e.g. *Listeria* grows well at $20-25^{\circ}\text{C}$).
- A total incubation period of 7 days is generally sufficient for routine isolation procedure, which can be extended up to 14 days before discarding those that do not show evidence of growth.

296. Infective endocarditis after tooth extraction is probably due to ?

- a) Streptococcus viridans
- b) Streptococcus pneumoniae
- c) Streptococcus pyogenes
- d) Staphylococcus aureus

Correct Answer - A

Ans. is 'a' i.e., Streptococcus viridans

- *Viridans streptococci* are normally resident in the mouth and upper respiratory tract. They cause transient bacteremia following tooth extraction or other dental procedures; and get implanted on damaged or prosthetic valves or in a congenitally diseased heart, and grow to form vegetations.
- They are ordinarily nonpathogenic but can on occasion cause disease. In persons with preexisting cardiac lesions, they may cause bacterial endocarditis, Str. sanguis being most often responsible.
- Str. mutans is important in causation of dental caries.
- The transient viridans streptococcal bacteremia induced by eating, tooth-brushing, flossing and other source of minor trauma, together with adherence to biological surfaces, is thought to account for the predilection of these organisms to cause endocarditis.
- Viridans streptococci are also isolated, often as a part of a mixed flora, from sites of sinusitis, brain abscess and liver abscess.
- Viridans streptococcal bacteremia occurs relatively frequently in neutropenic patients, particularly after bone marrow transplantation or high dose chemotherapy for cancer.

Treatment of viridans streptococcal infections include :-

.. Bacteremia in neutropenic patients → Vancomycin.

2. *Other infection* → Penicillin.

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297. Chronic carrier of typhoid shed bacilli for ?

- a) 1-3 weeks after cure
- b) 3 weeks to 3 months after cure
- c) 3 months - 1 year after cure
- d) More than 1 year after cure

Correct Answer - D

Ans. is 'd' i.e., More than 1 year after cure

Carriers

- Bacilli persist in the gall bladder or kidney and are eliminated in the feces (fecal carriers) or urine (urinary carrier), respectively.
- The development of the carrier state is more common in women and in older age groups (over 40 yrs)
- Carriers are the more frequent source of infection than cases.
- Urinary carriage is less frequent but more dangerous than intestinal carrier - *Park PSM*
- Urinary carrier is generally associated with some urinary lesions such as calculi or schistosomiasis.
- Presence of Vi antibody indicates the carrier state.

298. Ovoviviparous parasite which is associated with autoinfection ?

a) Ancylostoma duodenale

b) Strongyloides stercoralis

c) Enterobius vermicularis

d) Ascaris

Correct Answer - B

Ans. is 'b' i.e., Strongyloides stercoralis

Among the given options, strongyloides and enterobius can cause autoinfection.

Strongyloides is ovoviviparous, whereas enterobius is oviparous.

299. Double stranded RNA virus ?

a) Rotavirus

b) Measles virus

c) Mumps virus

d) Influenza virus

Correct Answer - A
Ans. is 'a' i.e., Rotavirus

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300. Earliest growth of diphtheria is detect on which media ?

a) Potassium tellurite media with iron

b) McConkey's agar

c) Dorset egg medium

d) Loeffler's serum slope

Correct Answer - D

Ans. is 'd' i.e., Loeffler's serum slope

Diphtheria bacilli grow on Loeffler's serum slope very rapidly and colonies can be seen in 6-8 hours, long before other bacteria grow.

301. Blood agar is an example of ?

a) Enriched media

b) Indicator media

c) Enrichment media

d) Selective media

Correct Answer - A
Ans. is 'a' i.e., Enriched media

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302. Virus causing oropharyngeal carcinoma ?

a) EBV

b) HPV

c) HHV-8

d) HTLV

Correct Answer - B
Ans. is 'b' i.e., HPV

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303. Temperature required for holding period of 20 minutes in Hot air oven -

a) 160° C

b) 170° C

c) 120° C

d) 130° C

Correct Answer - B
Ans. is 'b' i.e., 170° C

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304. Break bone fever is caused by ?

a) Yellow fever

b) Japanese encephlitis

c) Dengue fever

d) KFD

Correct Answer - C

Ans. is 'c' i.e., Dengue fever

Break bone fever (Saddle back fever) is caused by dengue virus.

Dengue fever

- Dengue fever is caused by arboviruses (at least 4 serotypes have been recognized)
- It is transmitted by Aedes (*Aedes aegypti* is the main vector).
- The reservoir of infection is both man and mosquito.
- The transmission cycle is Man-mosquito-man
- Dengue fever occurs both epidemically and endemically. Epidemics starts in rainy season and are usually explosive.
- Aedes mosquito becomes infective by feeding on a patient from the day before onset to the 5th day of illness.
- *Various manifestations of Dengue infection*
 - A) Classical dengue fever –**
 - i. Also known as break bone fever
 - i. Incubation period 2-7 days (3-10 days -4 Park)
 - i. Onset is sudden with chills and fever. Fever is usually between 39°C and 40°C temperature returns to normal after 5-6 days or subside on about the 3rd day and rise again after 5-8 days after onset (*saddle back fever*).
 - i. Rashes appear in 80% of cases during remission or during second febrile phase. The rash lasts for 2 hours to several days and may be

followed by desquamation.

B) Dengue Hemorrhagic fever (DHF)-

- It is a severe form of dengue fever caused by *infection with more than one dengue virus*.
- The severe illness is thought to be due to double infection with more than one dengue virus.
- *Dengue hemorrhagic fever is believed to result from reinfection with a virus of different serotype (due to enhancing antibodies)*
- DHF usually occurs after sequential infection with any two of the four serotypes of dengue virus.
- Sequence of infection may be important; serotype 1 followed by serotype 2 is more dangerous than serotype 4 followed by serotype 2.

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305. In pontiac fever, which antigen is seen in urine?

a) Lipopolysaccharide-1

b) Lipopolysaccharide-2

c) Lipopolysaccharide-4

d) Lipopolysaccharide-6

Correct Answer - A

Ans. is 'a' i.e., Lipopolysaccharide-1

Legionella are classified into serogroup on the basis of group specific lipopolysaccharide (somatic antigen or 'O' antigen).

Legionella pneumophila sero-group-1 (LP-1) is the most common infecting organism.

Urine test detect LP-1.

306. Spores of clostridium perfringens are located ?

- a) In the middle of cells
- b) At the poles of cells
- c) Between middle and pole of cells
- d) None of the above

Correct Answer - C

Ans. is 'c' i.e., Between middle and pole of cells

- Clostridium perfringens (C. perfringens) is a spore-forming gram-positive bacterium that is found in many environmental sources as well as in the intestines of humans and animals. C. perfringens is commonly found on raw meat and poultry

Spores of clostridium may be:?

1. Terminal: Located at poles.
2. Central: Located in the middle of the cells.
3. Subterminal: Between the middle of the cell and pole of the cells.

307. Agar media used for Haemophilus influenza ?

a) Blood agar

b) Chocolate agar

c) Tryptose agar

d) BYCE agar

Correct Answer - B

Ans. is 'b' i.e., Chocolate agar

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308. Mechanism of action in pathogenesis of Pseudomembranous colitis by *C. difficile* ?

a) Due to invasiveness

b) Due to endotoxin

c) Due to exotoxin

d) Due to NM blockade

Correct Answer - C

Ans. is 'c' i.e., Due to exotoxin

Pathogenesis of pseudomembranous colitis is due to production of two large toxins by *C. difficile* :

i) Toxin A (an enterotoxin)

- Is a potent neutrophil chemoattractant
 - Causes disruption of cell cytoskeleton by glycosylation of GTP - binding proteins that regulate the actin cell cytoskeleton.
- ii) Toxin B (a cytotoxin)
- Causes disruption of cell cytoskeleton by similar mechanism.

309. Virus causing Latent infection (or Latent period is shown by which virus) -

a) Rubella

b) HBV

c) Pertussis

d) Rota virus

Correct Answer - B
Ans. is 'b' i.e., HBV

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310. True regarding arbovirus is all except ?

- a) KFD is transmitted by Tick
- b) Dengue virus has one Serotype
- c) Yellow fever is not seen in India
- d) Dengue fever is transmitted by Aedes

Correct Answer - B

Ans. is 'b' i.e., Dengue virus has one Serotype

- *KFD is mainly transmitted by Hard tick, but soft tick can also transmit the disease.*
- *Dengue virus has four serotypes.*
- *Yellow fever is not endemic in India, it is distributed in Africa and South America.*
- *Dengue fever is transmitted by Aedes mosquito.*

311. Bacteria not affected by streptogramins is ?

a) *E. coli*

b) *Staphylococcus aureus*

c) *Legionella*

d) *M. pneumoniae*

Correct Answer - A

Ans. is 'a' i.e., *E. coli*

Streptogramins are active against gram-positive cocci and organisms responsible for atypical pneumonia (e.g., *M. pneumoniae*, *Legionella* spp., and *Chlamydia pneumoniae*), but largely inactive against gram-negative organisms.

They are bactericidal against streptococci and many strains of staphylococci, but bacteriostatic against *E. faecium*.

312. Smallest Virus is ?

a) Herpes virus

b) Adenovirus

c) Parvovirus

d) Poxvirus

Correct Answer - C
Ans. is 'c' i.e. Parvovirus

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313. Infectivity of HBV is indicated by ?

a) HBeAg

b) HbsAg

c) HBV DNA

d) Anti HBs Ag

Correct Answer - A
Ans. is 'a' i.e., H BeAg

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314. True about CMV are all except ?

- a) Most common cause of post-transplantation infection
- b) Most common cause of transplacental infection
- c) A non-enveloped DNA virus
- d) Produces intranuclear inclusions

Correct Answer - C

Ans. is 'c' i.e., A non-enveloped DNA virus

CMV is an enveloped DNA virus, belongs to Herpesviridae.

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315. Not ture about El Tor biotype of vibrio cholerae?

a) Lower mortality

b) Less SAR

c) Less chances of survival in environment

d) VP (+)

Correct Answer - C

Ans. is 'c' i.e., Less chances of survival in environment

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316. HSV-2 (Herpes simplex) causes ?

a) Oral ulcers

b) Genital ulcers

c) U.T.I.

d) Pharyngitis

Correct Answer - B
Ans. is 'b' i.e., Genital ulcer

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317. Which of the following is the mechanism of action of tetanospasmin ?

- a) Inhibition of release of GABA and glycine
- b) Inhibition of Ach release from synapse
- c) Inhibition of protein synthesis
- d) Activation of adenylyl cyclase

Correct Answer - A

Ans. is 'a' i.e., Inhibition of release of GABA and glycine

Pathogenicity

- *CL tetani has little invasive property and is confined to the primary site of lodgment. Tetanus results from the action of the potent exotoxin it produces.*

318. Ebola virus belongs to?

a) Picornaviridae

b) Togaviridae

c) Flaviviridae

d) Filoviridae

Correct Answer - D
Ans. is 'd' i.e., Filoviridae

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319. Bollinger bodies are seen in ?

a) Chickenpox

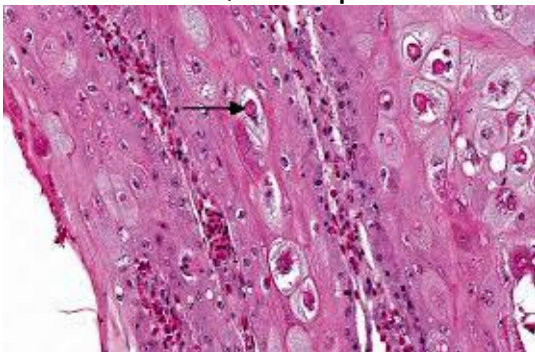
b) Cowpox

c) Fowlpox

d) Smallpox

Correct Answer - C

Ans. is 'c' i.e., Fowl pox



320. All are true regarding Japanese encephalitis except ?

- a) Caused by flavivirus
- b) Humans are dead-end hosts
- c) Transmitted by culex
- d) Cattles are amplifier hosts

Correct Answer - D

Ans. is 'd' i.e., Cattles are amplifier hosts
Japanese encephalitis

- Caused by a group *B arbovirus* (flavivirus)
- It is a *Zoonotic disease* ie infecting mainly animals and incidentally man.
- In south, epidemics have occurred in *Karnataka*, Andhra Pradesh, TamilNadu, and Kerala.
- Human, cattle, and horses are dead-end hosts as the disease manifests as fatal encephalitis.
- Pigs act as an amplifying host and have a very important role in the epidemiology of the disease.
- Infection in swine is asymptomatic, except in pregnant sows, when abortion and fetal abnormalities are common sequelae.
- The most important vector is *Culex tritaeniorhynchus*, which feeds on cattle in preference to humans.
- The natural hosts of the Japanese encephalitis virus are birds, not humans.
- In November 2011, the Japanese encephalitis virus was reported in *Culex bitaeniorhynchus* in South Korea

321. All are seen with *Pneumocystis carini* in AIDS except

- a) Pneumonia
- b) Otic polypoid mass
- c) Ophthalmic choroid lesion
- d) Meningitis

Correct Answer - D

Ans. is' i.e., Meningitis

- *P. jiroveci* (formerly known as *P. carinii*) causes interstitial pneumonia in AIDS patients.
- *Pneumocystis* otomastoiditis present with unilateral otalgia, otorrhea, hearing loss and a polypoid mass on otoscopy.
- Ocular *pneumocystis* is typically restricted to choroidal layer producing multiple focal circumscribed creamy to yellow-white lesions

322. Antibiotic sensitivity testing can be done using all except

a) E test

b) Kirby-Bauer method

c) Culture agar method

d) Broth dilution method

Correct Answer - C

Ans. is 'c' i.e., Culture agar method

Tests used for antimicrobial sensitivity are :

1. Disc susceptibility test (most commonly used)
2. Broth dilution susceptibility test
3. Kirby-Bauer disc diffusion method
4. E-test (Epsilon meter test)

323. Type E adverse reaction is

- a) Toxicity
- b) Augmented effect
- c) Teratogenesis
- d) Withdrawal reaction

Correct Answer - D

Ans. is 'd' i.e., Withdrawal reaction

Type A (Augmented) reaction

- Excess of normal, predictable, dose related pharmacodynamic effect.
- May occur in everyone
- eg - Postural hypotension, hypoglycemia

Type B (Bizzare) reaction

- Due to unusual attributes of the patient interaction with the drug.
- Not dose related
- Not a part of normal pharmacological effect of a drug.
- Occurs only in some people.
- eg - Idiosyncrasy and drug allergy.

Type C (chronic) reaction

- Due to long term exposure
- eg; Analgesic nephropathy, dyskinesia by levodopa, immunosuppression by corticosteroids.

Type D (Delayed) effects

- eg; Carcinogenesis or teratogenesis.

Type E (Ending of use) reaction

- 3 eg; withdrawal reactions with clonidine.

324. Treponema pallidum was discovered by ?

a) Robert Koch

b) Twort

c) Schaudinn and Hoffman

d) Ellerman

Correct Answer - C

Ans. is 'c' i.e., Schaudinn and Hoffman

Bacteria	Discovered by
Lepra bacillus (M. Leprae)	Hansen (1874)
Gonococcus	Neisser (1879)
Staphylococcus	Ogston (1881)
Diphtheria bacillus (C. Diphtheria)	Loeffler (1884)
Tetanus bacillus (C. Tetani)	Nicolaier (1884)
Pneumococcus	Fraenkel (1886)
Causative organism for Malta fever (Brucella)	Bruce (1887)
<i>Spirochete of syphilis (T pallidum)</i>	<i>Schaudinn and Hoffmann (1905)</i>

325. Lactose fermentation is seen in ?

- a) Blood agar
- b) Chocolate agar
- c) MacConkey agar
- d) LJ medium

Correct Answer - C

Ans. is 'c' i.e., MacConkey agar

- Culture on differential media that contain special dyes and carbohydrates distinguishes lactose-fermenting (colored) from non-lactose-fermenting (non-pigmented) colonies and may allow rapid presumptive identification of enteric bacteria.
- Such media, used to see lactose fermentation, are :?
 1. Eosine-methylene blue (EMB)
 2. MacConkey's agar
 3. Deoxycholate agar

326. Major immunoglobulin secreted by intestine ?

a) IgG

b) IgM

c) IgA

d) IgD

Correct Answer - C

Ans. is 'c' i.e., IgA

It is the second most abundant antibody (after IgG)

It is major immunoglobulin in clostrum, saliva, tears, respiratory and gastrointestinal secretions.

327. False about viruses is ?

a) Ribosomes absent

b) Mitochondria absent

c) Motility absent

d) Nucleic acid absent

Correct Answer - D

Ans. is 'd' i.e., Nucleic acid absent

- Viruses contain nucleic acid, either RNA or DNA.

Properties of viruses

- Viruses are obligate intracellular parasites.
- They lack enzymes necessary for protein and nucleic acid synthesis and are dependent for replication on the synthetic machinery of host cells so, they cannot grow in cell free culture media.
- They do not have cellular organization.
- They are unaffected by antibacterial antibiotics.
- They contain only one type of nucleic acid, either RNA or DNA, never both.
- They multiply by a complex process and not by binary fission.
- The extracellular infectious virus particle is called the virion. o With few exceptions, viruses are very heat labile.

328. Arrangement of lens from eye to source of light, in light microscope ?

a) Ocular lens : Subjective lens : Condensor lens

b) Subjective lens : Ocular lens : Condensor len

c) Condensor lens : Subjective lens : Ocular lens

d) Subjective lens : Condensor lens : Ocular lens

Correct Answer - A

Ans. is 'a' i.e., Ocular lens : Subjective lens : Condensor lens

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329. Numbers of variable regions on each light and heavy chain of an antibody ?

a) 1

b) 2

c) 3

d) 4

Correct Answer - A

Ans. is 'a' i.e., 1

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330. Hybridoma technique is used to obtain ?

a) Specific antigen

b) Complement

c) Specific antibody

d) Interleukins

Correct Answer - C

Ans. is 'c' i.e., Specific antibody

- Hybridomas are cells that have been engineered to produce a specific antibody in huge numbers.

Hybridomas

- Hybridomas are cells that have been engineered to produce a specific antibody in huge numbers
- To achieve this, qualities of two types of cells have to be combined together i.e.
- Cells which can produce large amount of pure antibody and
- Cells which have the ability to grow continually.
- These two types of cells are then fused together to form hybridoma.

Procedure

- The pure antibody secreting cells are produced by injecting specific antigen in a mouse and obtaining the antigen specific plasma cells (antibody producing cell) from the mouse's spleen.
- Cell which can grow indefinitely in culture are myeloma cells (cancerous cells).
- These two cell lines are fused together. The hybrid cell which is thus produced can be cloned to produce large number of identical daughter clones.
- These daughter clone cells then produce antibodies. Since these antibodies come from only one type of cell (hybridoma cell) they are

called monoclonal antibodies.

- HAT (hypoxanthine, Aminopterin and thymidine) medium is used for preparation of monoclonal antibodies because it allows only fused hybridoma cells to grow. It does not allow the unfused myeloma and unfused antibody cells to grow. So HAT medium is a selective medium which allows (which allow selective growth of fused hybridoma)
- How does this happen ?
- Before we move on with the discussion, remember these few points about purine synthesis.
- Purine synthesis is essential for the survival of cells.
- Purine can be synthesized in two way i.e.
- De novo synthesis (dihydrofolate reductase enzyme is required for this pathway).
- Salvage pathway (an enzyme hypoxanthine - guanine phosphoribosyl transferase is required for salvage pathways)
- Myeloma cells lack HGPRTase enzyme therefore they cannot synthesize purine by salvage pathways. o Antibody cells have HGPRTase enzyme so they can use the salvage pathways.
- Aminopterin inhibits dihydrofolate reductase an enzyme used in denovo synthesis of purine
- When two cell lines i.e. antibody producing cell and myeloma cells are grown in HAT medium only the fused hybridoma cells survive.
- Myeloma cells die because they lack the enzyme HGPRTase so they cannot use the salvage pathways for purine synthesis. They also cannot use de-novo pathway, because Aminopterin present in the HAT medium inhibits dihydrofolate reductase (an enzyme essential for denovo synthesis of purine).
- The unfused antibody producing cells die as they cannot grow indefinitely because of their limited life span.
- Only fused hybridoma cells grow indefinitely because the antibody cell partner supplies HGPRTase and the myeloma partner gives it immortality. (as it is a cancer cell)

331. Which is not a DNA virus ?

a) Parvovirus

b) Papovavirus

c) Poxvirus

d) Rhabdovirus

Correct Answer - D
Ans. is 'd' i.e., Rhabdovirus

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332. All are sporicidal agents except ?

a) Formaldehyde

b) Glutaraldehyde

c) Ethylene oxide

d) Isopropyl alcohol

Correct Answer - D

Ans. is 'd' i.e., Isopropyl alcohol

Sporicidal agents

- Bacterial spores constitute some of the most resistant forms of life.
- By nature bacterial spores are resistant to extreme physical, chemical and thermal conditions and are second only to prions in their resistance to disinfection.
- They are resistant to most of the disinfectants.
- Only a few agents are effective against them.
- Sporicidal agents are -
 - Glutaraldehyde
 - Formaldehyde
 - Halogens
 - .. Iodine compounds -, Iodine, Iodophors
 - .. Chlorine compounds → Sodium hypochlorite, chlorine tablets
 - Ethylene oxide
 - Peroxygens → hydrogen peroxide, peracetic acid.
 - Beta propiolactone
 - Ozone
- Following compounds are usually sporostatic, but may become sporicidal at higher temperature?
 - Phenols
 - Cresols

- Organomercury compounds (Sodium thioglycolate)
- Chlorhexidine (Hibitane)

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333. In blood culture the ratio of blood to reagent is ?

a) 1:5

b) 1:20

c) 1:10

d) 1:100

Correct Answer - C

Ans. is 'c' i.e., 1:10

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334. Sabin feldman Dye test is used to demonstrate infection with ?

a) Filaria

b) Toxoplasma

c) Histoplasma

d) Ascaris

Correct Answer - B

Ans. is 'b' i.e., Toxoplasma

- The polyclonal IgG antibodies evoked by infection are parasitocidal in vitro in the presence of serum complement and are the basis for the Sabin - Feldman dye test.

Laboratory diagnosis of toxoplasmosis

- Laboratory diagnosis can be made by
 1. Microscopic demonstration of the parasite
 2. Isolation of the parasite by animal inoculation or tissue culture.
 3. Polymerase chain reaction
 4. Serology
- The most common method of laboratory diagnosis
- Persons should initially be tested for the presence of Toxoplasma specific IgG antibodies to determine their
- immune status. A positive IgG titre indicates infection with the organism at sometime (recent or past).
- Then an IgG positive person should have an IgM test. A negative test essentially excludes recent infection. However, a positive IgM test does not always mean a recent infection because toxoplasma specific IgM antibodies may persist for months to year following primary infection. Therefore :?
- Negative IgM with positive IgG always means a past infection.

- Positive IgM with positive IgG indicates possibility of recent infection, but not with 100% surety. It may or may not be recent infection. To differentiate between recent and past infection, IgG avidity test is used.
- It is worth noting here that a third situation is also possible when IgM test is positive but IgG test is negative. In this situation a second sample should be taken after 2-4 weeks and should be tested :?
- If the second sample is positive for IgG and IgM, it indicates that the first sample was taken early in the disease when IgG was not yet developed.
- If the second sample is still negative for IgG with positive IgM, it indicates false positive IgM test.

Tests for IgG antibodies

IgG ELISA/EIA
Sabin- Fieldman dye test
IgG indirect fluorescent antibody test (IgG IFA)
Differential agglutination (AC/HS)
Avidity test

Tests for IgM antibodies

IgM indirect fluorescent antibody test (IgM IFA)
Double sandwich ELISA
IgM capture EIA
Immunosorbant agglutination assay (ISAGA)

335. Culture medium used for entamoeba histolytica?

- a) Blood agar
- b) Philip's medium
- c) CLED medium
- d) Trypticase serum

Correct Answer - B

Ans. is 'b' i.e., Philip's medium

Cultures media used for cultivation of E. histolytica are :-

1. Boeck and Drbohlav's medium
2. Philip's medium
3. Shaffer and Frye's medium
4. Jones medium
5. Balamuth's medium
6. Diamond's medium

336. Ascospore is ?

- a) Asexual spore
- b) Sexual spore
- c) Conidia
- d) None of the above

Correct Answer - B

Ans. is 'b' i.e., Sexual spore

Fungal spores

- Most fungi reproduce through the generation of spores
- Fungi produce spores by two methods?
- Sexual reproduction → Sexual spores
- Asexual reproduction → Asexual spores

337. Most common staphylococcal phage strain causing hospital infection ?

a) 80/81

b) 79/80

c) 3A/3C

d) 69/70

Correct Answer - A

Ans. is 'a' i.e., 80/81

Hospital strains of staphylococcus aureus

- Certain strains of staphylococcus are the common cause of post-operative wound infections and other infections in the hospital environment.
- These strains are known as **hospital strains**.
- The hospital strains show the following characteristics:
 1. They are resistant to penicillin, methicillin and other routinely used antibiotics.
 2. They belong to certain bacteriophage types.
 3. Some of the strains (eg phage type 80/81) are known to cause hospital infections throughout the world. Such strains are called as epidemic strains.

338. All of the sterilization methods are properly matched except ?

a) Catgut suture - Radiation

b) Culture media - Autoclaving

c) Bronchoscope - Autoclaving

d) Glassware & syringes - Hot air oven

Correct Answer - C

Ans. is 'c' i.e., Bronchoscope - Autoclaving

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339. Endoscope tube is sterilized by?

a) Glutaraldehyde

b) Formalin

c) Autoclaving

d) Boiling

Correct Answer - A

Ans. is 'a' i.e., Glutaraldehyde

- 2% Glutaraldehyde (cidex) is most often used for equipment such as endoscope that cannot be sterilized or disinfected by heat.

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340. All are true regarding resistance of penicillin in staphylococcus aureus, except ?

- a) Penicillinase production is transmitted by transduction
- b) Methicillin resistance is due to change in PBP
- c) Hospital strains mostly produce type D penicillinase
- d) Penicillinase production is plasmid mediated

Correct Answer - C

Ans. is 'c' i.e., Hospital strains mostly produce type D penicillinase
Resistance to antibiotics

- a Penicillin resistance is of three types?
 1. Production of beta-lactamase (penicillinase)
- It inactivates penicillin by splitting beta-lactam ring
- Its production is controlled by plasmid.
- Plasmid is transmitted by transduction (mainly) or conjugation.
- Penicillinase is an inducible enzyme
- As a result of the widespread dissemination of plasmids containing penicillinase, less than 5% strains of staph. remain susceptible to penicillin.
- Staphylococci produce four types of penicillinases, A to D. Hospital strains usually form type 'A' penicillinase.
 2. Changes in bacterial surface receptors by lack or inaccessibility of certain penicillin-binding proteins (PBPs) in the organism.
- Methicillin-resistant is mainly due to this mechanism and is independent of beta-lactamase production.
- It is due to the production of PBP 2a.
- This change (in bacterial surface receptors) is normally

chromosomal.

- The resistance gene is mec A gene which is a part of a large mobile genetic element - staphylococcal cassette chromosome (SCCmec).
 - This genetic material has been transferred to Staph. aureus from S. seiuri.
3. Development of tolerance to penicillin, by which the bacterium is only inhibited but not killed

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341. Which of the following is not capsulated ?

a) Pneumococcus

b) Cryptococcus

c) Meningococcus

d) Proteus

Correct Answer - D

Ans. is 'd' i.e., Proteus

Capsule

- Many bacteria secrete a *viscid material* around the cell surface.
- When this is organized into a sharply defined structure, it is known as *capsule*.
- Capsules are protective and protect the bacteria from phagocytosis and from lytic enzymes.
- Some bacteria lose their capsules on repeated subcultures.

Capsulated organisms

Pneumococcus

Yersinia

Bacillus anthrax

V. parahemolyticus

Bordetella

H. influenzae

Meningococci

Fresh strains of staphylococci, streptococci and 'E coli.

Cl. perfringens and Cl. butyric=

Bacteroides

Klebsiella

Cryptococcus.

342. All are true regarding interleukin-1 except ?

- a) Primary source is monocyte-macrophage system
- b) Endogenous pyrogens
- c) Inhibit IL-2 production by T-cells
- d) All are true

Correct Answer - C

Ans. is 'c' i.e., Inhibit IL-2 production by T-cells

Interleukin -1

- Also known as leucocyte activating factor (LAF) or B cell activating factor (BAF).
- Principally secreted by macrophages and monocytes; and epithelial cells.
- Other sources are B lymphocytes, fibroblasts and endothelial cells.
- Immunological effects-
- Activation of T cells for the production of IL - 2.
- B cell proliferation and antibody synthesis
- Neutrophil chemotaxis and increased PMN release from bone marrow.
- Increases body temperature (important endogenous pyrogen).
- Bone marrow cell proliferation
- Induction of acute phase protein.

343. Which of the following is a superantigen ?

a) Cholera toxin

b) Diphtheria toxin

c) TSST

d) Vero-cytotoxin

Correct Answer - C

Ans. is 'c' i.e., TSST

Superantigens

- Certain species of infectious microorganisms produce powerful, immunostimulatory and disease causing toxins called superantigen, so called because of their ability to polyclonally active large fraction (up to 20%) of T cell population.
- Superantigens are potent activators of T-lymphocytes.
- Superantigens stimulate very large numbers of T cells, without relation to their epitope specificity. This leads to an excessive and dysregulated immune response with release of cytokines IL - 1, IL - 2, TNF - α and IF - γ .
- Conventional antigens bind to MHC class I or II molecules in the groove of the $\alpha\beta$ dimer (T cell receptor). In contrast, superantigen bind directly to the lateral portion of TCR β chain and MHC class II β chain, and stimulate T cells solely on V β gene segment utilized independent of the D, J and α - sequences present $\rightarrow$ T β 3 restricted T cell mitogens.
- Superantigens are capable of activating up to 20% of the peripheral T-cell pool, where as conventional antigens activate < 1 in 10, 000.

Examples of superantigen

Staphylococcal toxic shock syndrome Certain nonhuman

Staphylococcal toxic shock syndrome toxin

Staphylococcal enterotoxins

Staphylococcal exfoliative (erythrogenic) toxin

Streptococcal toxic shock syndrome toxin

retroviral proteins.

Yersinia

pseudotuberculosis

Mycoplasma arthritis.

Mouse mammary tumor virus.

344. Thomsen friedensreich phenomenon is ?

- a) Red cells infection by CMV
- b) Red cell agglutination by all blood group sera
- c) Hemolysis of transfused blood
- d) Due to B antigen

Correct Answer - B

Ans. is 'b' i.e., Red cell agglutination by all blood group sera

Thomsen-Freidenreich Phenomenon

- Red cell suspensions contaminated with certain bacteria, e.g. pseudomonas aeruginosa, become agglutinable by all blood group sera and even by normal human sera.
- This is known as Thomsen Friedenreich phenomenon and is due to unmasking of a hidden antigen normally present on all human erythrocytes, i.e. T-antigen.
- Anti-T agglutinins are normally present in human sera.
- Such panagglutinability of red cells has occasionally been observed in persons suffering from systemic bacterial infections.

345. Most common organism causing URTI in adult?

a) H influenza

b) Stap aureus

c) Strepto pneumonia

d) Streptococcus pyogenes

Correct Answer - D

Ans. is 'd' i.e., Streptococcus pyogenes

- Most common cause of upper respiratory tract infection is viral infection. Rhinovirus is the most common cause.
- Among the bacteria, group A beta-hemolytic streptococci (streptococcus pyogenes) is the most common cause.
- And most common type of infection is pharyngitis.

346. Street rabies virus cause ?

a) Natural rabies

b) Laboratory passage in rabbit

c) Fatal encephalitis in 6 days

d) Negri bodies not seen

Correct Answer - A

Ans. is 'a' i.e., Natural rabies

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347. All are true about Helminths, except?

a) Alimentary canal is complete in Nematodes

b) Body cavity is present in trematodes

c) Nematodes have separate sexes

d) Alimentary canal is Present but incomplete

Correct Answer - B

Ans. is' i.e., B- Body cavity is present in trematodes

Option b is incorrect → Body cavity is present in trematodes, It is Actually Absent.

Option d is correct--> alimentary canal is present in trematodes, it is incomplete with no anus.

• **Thus, option b is the best answer here.**

• Table showing the differences between Cestodes, Trematodes and Nematodes

	Cestode	Trematode	Nematode
<i>Shape</i>	Tape-like; segmented	Leaf-like; unsegmented	Elongated, cylindrical; unsegmented
<i>Sexes</i>	Not separate, i.e., hermaphrodite (monoecious)	Not separate (Monoecious), except Schistosomes which are diecious	Separate (diecious)
<i>"Head" End</i>	Suckers, often with hooks	Suckers, no hooks	No suckers, no hooks Well-developed buccal

			capsule in some species
<i>Alimentary canal</i>	Absent	Present but incomplete/ no anus	Present and complete anus present
<i>Body cavity</i>	Absent	Absent	Present

348. Which of the following amoebae does not have neuropathogenic effect ?

a) Naegleria

b) Acanthamoeba

c) Dientamoeba

d) Bala muthia

Correct Answer - C

Ans. is 'c' i.e., Dientamoeba

Neuropathogenic amoebae are

- Naegleria Fowleri Causes primary amebic meningoencephalitis.
- Acanthamoeba causes granulomatous amebic encephalitis
- Balamuthia mandrillaris causes amebic meningoencephalitis.

349. All of the following are important mechanisms of gene transfer in bacteria, except ?

- a) Lateral gene transfer
- b) Conjugation
- c) Vertical gene transfer
- d) Horizontal gene transfer

Correct Answer - C

Ans. is 'c' i.e., Vertical gene transfer

Gene transfer

- Gene transfer refers to the process of genetic material (e.g. DNA) being sent and received among two organisms- * Donor sends and recipient receives the genetic material.
- There are two processes of gene transfer :?
 1. Horizontal gene transfer (HGT) or lateral gene transfer
- Horizontal gene transfer is the process by which genetic material is passed between two different organism, i.e. organism of different species.
- The recipient is not the offspring of donor.
- The most important example is gene transfer between the bacteria.
- The processes of horizontal gene transfer in bacteria are : -
 1. Transduction
 2. Transformation
 3. Conjugation
- 2. Vertical gene transfer
- Vertical gene transfer is the process of transferring genetic material to organism of same species, i.e. donor receives genetic material

- from its ancestor, e.g. its parent or a species from which it evolved.
- Therefore, the donor will have the same general makeup as the parents.
 - Vertical gene transfer is "a mix of two parents", i.e. when two organisms mate, their genes are vertically transferred to their spawn.
 - This process is not important in bacteria.

350. All are true regarding development of T-cells, except?

- a) T-cells are formed in bone marrow
- b) Maturation of T-cells take place in thymus
- c) T-cell are located in mantle layer of spleen
- d) In lymph nodes, T-cells are found in paracortical area

Correct Answer - C

Ans. is 'c' i.e., T-cell are located in mantle layer of spleen

T cells origin and maturation

- T cells originate in the bone marrow, fetal liver and yolk sac and mature in thymus.
- T cell precursors from the yolk sac, fetal liver and bone marrow migrate to the thymus during embryonic and postnatal life.
- Maturity of T-cells takes place in the thymus.
- After maturity T-lymphocytes are selectively seeded into certain sites of the peripheral lymphatic tissues, known as "thymus - dependent regions".
- Thymus dependent regions are -
- Paracortical area of lymph node.
- White pulp of the spleen, around the central arteriole.
- After neonatal thymectomy, the source of mature T cells (thymus) will be absent. As a result the thymus dependent regions of peripheral lymphoid organs will be depleted of T cells.

B-cell origin and maturation

- In contrast to T cells (which originate in bone marrow and mature in thymus), origin as well as maturation of B- cells takes place in the bone marrow.
- After maturation, B- cells migrate to peripheral T- cell independent

lymphoid regions.

- T- cell independent regions are ?
 - .. Perifollicular region and mantle layer of spleen.
 - 2. Cortical follicles, germinal centres and medullary cords of lymph node.

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351. The only ovoviviporous parasite ?

a) Ascaris

b) Strongyloides

c) Enterobius

d) Ancylostome

Correct Answer - B

Ans. is 'b' i.e., Strongyloides

- Strongyloides stercoralis is a human pathogenic parasitic roundworm causing the disease strongyloidiasis.
- Ovo-viviparous (lay eggs which hatch immediately)
- Strongyloides stercoralis, a ovo-viviparous intestinal nematode causes strongyloidiasis, which is manifested by skin rashes, eosinophilia, and abdominal abdominal pain.
- Infection usually usually results in asymptomatic chronic disease of the gut, which can remain undetected for decades.

352. All organisms shows bipolar staining except ?

a) Calymmatobacter granulomati

b) Y. pestis

c) Pseudomonas mallei

d) H. influenzae

Correct Answer - D

Ans. is 'd' i.e., H. influenzae

Safety pin appearance (Bipolar staining)

- 1. Yersinia pestis
- 2. Vibrio parahemolyticus
- 3. Burkholderia mallei
- 4. Burkholderia pseudomallei
- 5. Klebsiella granulomatis

353. Draughtsman (Concentric Rings) on culture are produced by ?

a) *Yersinia pestis*

b) *H. ducreyi*

c) *B. pertusi*

d) Pneumococci

Correct Answer - D

Ans. is 'd' i.e., Pneumococci

- Due to alpha hemolysis, colonies of pneumococci resemble colonies of *Str. viridans*.
- But on further incubation, the colonies of pneumococci become flat with raised edges and central umbonation, so that concentric rings are seen on the surface when viewed from above --> draughtsman or Carrom coin appearance.

354. Causative agent for melioidosis is ?

a) *Pseudomonas pseudomallei*

b) *Pseudomonas aeruginosa*

c) *Pseudomonas cepacia*

d) *Pseudomonas mallei*

Correct Answer - A

Ans. is 'a' i.e., *Pseudomonas pseudomallei*

- *Burkholderia pseudomallei* is a recognized biothreat agent and the causative agent of melioidosis. This Gram-negative bacterium exists as a soil saprophyte in melioidosis-endemic areas of the world and accounts for 20% of community-acquired septicaemia in northeastern Thailand where half of those affected die.
- Melioidosis can be contracted via cutaneous inoculation, inhalation, or ingestion, and can present with extremely varied symptoms, these vague symptoms and diverse clinical presentations, along with culture-based diagnostic anomalies, make it difficult to properly diagnose in clinical settings. No vaccines against *B. pseudomallei* are currently available, making rapid detection and specific antibiotic treatment crucial for favorable outcomes in infected humans

355. Specific reason to disallow the sample for culture?

- a) Sample brought within 2 hr of collection
- b) Sample brought in sterile plastic container
- c) Sample brought in formalin
- d) Sample obtained after cleaning the collection site

Correct Answer - C

Ans. is 'c' i.e., Sample brought in formalin

Guidelines for proper specimen collection

- Collect specimen before administering antibiotics or antivirals when possible.
- Collect specimen with as little skin contamination as possible to ensure that the sample collected represents the infected site.
- Utilize appropriate collection devices. Use sterile equipment and aseptic technique to collect specimens to prevent introduction of microorganisms during invasive procedures.
- Clearly label the specimen container with patient's name, hospital number or other identifying number (i.e. birth date, requisition number), date and time of collection.
- Collect an adequate amount of specimen. Inadequate amounts of specimen may yield false-negative results.
- If a specimen is collected through intact skin, cleanse the skin first. For example, use 70% alcohol followed by iodine solution (1 to 2% tincture of iodine or 10% solution of povidone iodine).
- Collect fluid specimens in sturdy, sterile, screw cap, leak proof containers with lids that do not create an aerosol when opened.
- Specimens obtained by a physician using needle aspiration should be transferred to a sterile tube or anaerobic transport vial prior to

transport of the specimen to the laboratory. If there is little material in the syringe, the physician should draw a small amount of sterile nonbacteriostatic 0.85% NaCl through the syringe and then transfer the specimen to a sterile tube. Alternatively, and ONLY if the specimen will be compromised by transferring it from the syringe, a small amount of sterile 0.85% NaCl may be drawn into the syringe prior to removal of the needle. **DO NOT TRANSPORT SYRINGES WITH NEEDLES ATTACHED AND/OR RECAPPED.** Attach syringe cap ONLY if necessary. The physician should use a protective device while removing the needle to avoid injury and should cap the syringe with a sterile cap prior to transporting it to the laboratory.

- Any Microbiology and Virology specimens collected in formalin are **UNACCEPTABLE** for culture.

356. Glass vessels and syringes are best sterilised by -

a) Hot air oven

b) Autoclaving

c) Irradiation

d) Ethylene dioxide

Correct Answer - A

Ans. is 'a' i.e., Hot air oven

Hot air oven

- Hot air oven are electrical devices used in sterilization.
- The oven uses *dry heat* to sterilize articles.

Hot air oven is used for

- Glass ware
- Swabs
- Liquid paraffin
- Fat and grease
- All glass syringe
- Forceps, scissors, scalpels
- Dusting powder

357. Spores of bacteria are destroyed by

a) Alcohol

b) Lysol

c) Halogen

d) Ionizing radiation

Correct Answer - C

Ans. is 'c' i.e., Halogen

- Amongst the given options, only halogens have sporicidal property

358. Cell wall deficient organisms are

a) Chlamydia

b) Mycoplasma

c) Streptococcus

d) Anaerobes

Correct Answer - B

Ans. is 'b' i.e., Mycoplasma

Mycoplasma

- Smallest free living organism, are prokaryotes
- Lack cell wall, are bounded by a triple layered unit membrane that contains sterol (therefore mycoplasmas require sterol for growth).
- Their lack of cell wall is associated with cellular pleomorphism and resistance to cell wall - active antimicrobial agents, such as penicillins and cephalosporins (13 - lactam drugs).
- Multiplication is by binary fission.
- Unique among prokaryotes is the requirement of most mycoplasmas for cholesterol and related sterols.

359. Vaccine is available against which type of meningococcus ?

a) Type A

b) Type B

c) Type A and C

d) Type B and D

Correct Answer - C

Ans. is 'c' i.e., Type A and C

- Vaccine is available against type A, type C, type Y and type W - 135 meningococci.

360. "Citron bodies" boat or leaf shaped pleomorphic organism in an exudate is

a) Cl. welchii

b) Cl. edematiens

c) Cl. septicum

d) Cl. tetani

Correct Answer - C

Ans. is 'c' i.e., Clostridium septicum

- Citron bodies and boat or leaf shaped pleomorphic bacilli with irregular staining suggest CL septicum".

Clostridium

- Clostridial species are :
- Gram positive
- Anaerobic (obligate anaerobe)
- Spore forming
- Bacilli
- Motile by peritrichate flagella except C perfringens and C. tetani type IV which are non motile.
- Non capsulated except C. perfringens and C. butyricum which are capsulated
- Pathogenesis is due to exotoxin not endotoxin.
- Clostridium botulinum causes botulism not gas gangrene.
- Gas gangrene is caused by :
 - C. perfringens (80%) → C novyi
 - C. septicum → C. histolyticum

361. Swarming growth on culture is characteristic of which Gram positive organism ?

a) Clostridium welchi

b) Clostridium tetani

c) Bacillus cereus

d) Proteus mirabilis

Correct Answer - B

Ans. is 'b' i.e., Clostridium tetani

Swarming growth

- Swarming growth is due to the motility of bacteria. In young culture, discrete colonies are seen but thereafter actively motile cells spread on the surface of the plate in successive waves to form a thin filmy layer in concentric circles.
- Gram-positive organism showing swarming growth → C. tetani and Bacillus cereus
- Gram-negative organism showing swarming growth → Proteus mirabilis and Proteus vulgaris

362. Most common genetic play in Neisseria infection is

a) Male gender

b) HLA b27

c) Complement deficiency

d) IgA deficiency

Correct Answer - C

Ans. is 'c' i.e., Complement deficiency

- It is an essential component of the innate immune defence against infection by Neisseria (N. meningitides and N. gonorrhoea).
- People who lack or have a deficiency in complement-mediated bactericidal activity are most susceptible to Neisseria diseases.
- Terminal complement component (C5 through C9) deficiencies and deficiencies of the alternative pathway (Properdin, C3, Factor D) have a strong effect on susceptibility to, as well as the severity of, neisserial infections.
- 1. Deficiency of terminal complement (C, - C9) component:- Deficiency of one of the terminal components that compose membrane attack complex (MAC) predisposes patients to infection with Neisseria meningitides or Neisseria gonorrhoeae. However, N. meningitides infection is more common.
- 2. Deficiencies of the terminal pathway:- Deficiencies in components of the alternative pathway, namely properdin, C3 and factor D, have been associated with increased susceptibility, almost exclusively, to meningococcal infection (amongst Neisseria).

363. Heat labile immunoglobulin

a) IgA

b) IgG

c) IgE

d) IgM

Correct Answer - C

Ans. is 'c' i.e., IgE

- Only heat labile Ig
- Inactivated at 56 degrees C in one hour.

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364. Which is the longest DNA of hepatitis B virus ?

a) P gene

b) X gene

c) S gene

d) C gene

Correct Answer - A
Ans. is 'a' i.e., P gene

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365. Bacterial count in doudenum

a) 10^5 per gram

b) 10^1 per gram

c) 10^{10} per gram

d) 10^2 per gram

Correct Answer - A

Ans. is 'a' i.e., 10^5 per gram

In GIT of an adult :

Duodenum → $10^3 - 10^6$ bacteria per gram.

Jejunum and proximal ileum → $10^1 - 10^8$ bacteria per gram

Lower ileum and cecum → $10^8 - 10^{10}$ bacteria per gram

Colon and rectum → $10^{11} - 10^{12}$ bacteria per gram

- Colon and rectum have maximum number of bacteria and most of them (96-99%) are anaerobes :
- Anaerobic streptococci
- Clostridia
- Anaerobic lactobacilli
- Bacteroides

366. Capacity of producing IgG starts at what age

a) 6 months

b) 1 year

c) 2 years

d) 3 years

Correct Answer - A

Ans. is 'a' i.e., 6 months

- Immediately after birth, the newborn has high level of IgG antibodies in blood stream. But these antibodies are passively transferred to the baby from mother (i.e., maternal antibodies).
- During next few months, the maternal IgG antibodies steadily decrease.
- When healthy baby is about 2-3 months old, the immune system starts producing its own IgG antibodies.
- *Once healthy babies reach six months of age, their IgG production reaches at normal level.*

Note

- IgM antibodies production starts before birth only (3-6 months before), but at very low level.

367. Job's syndrome is the following type of immunodeficiency disease

- a) Humoral immunodeficiency
- b) Cellular immunodeficiency
- c) Disorder of complement
- d) Disorder of phagocytosis

Correct Answer - D

Ans. is 'd' i.e., Disorder of phagocytosis

- Job's syndrome is defect in phagocytic function.
- It is characterized by cold staphylococcal abscess, atopic eczema, otitis media; serum immunoglobulins are normal except IgE that is elevated

368. Prions are best killed by

a) Autoclaving at 134°C

b) 5% formaline

c) Sodium hypochloride

d) None of these

Correct Answer - A

Ans. is 'A' i.e., Autoclaving at 134°C

- Incineration is the only way of disinfecting prion-contaminated materials or tissues.
- Boiling or irradiation does not affect and even routine autoclaving (at 121°C) is not reliable. Therefore, where there is a risk of exposure, surgeons use disposable instruments.
- To sterilize reusable instruments, WHO currently recommends combined use of a strong solution of sodium hydroxide and extended autoclaving at 134°C.
- "Autoclaving at 134°C for 5 hrs or treatment with 2N NaOH for several hours is recommended for sterilization of prions".
- since Sodium hydroxide option not available, correct answer is A

369. Most common cause of HUS in children is

a) E coli 0157/H7

b) S typhi

c) Shigella

d) None

Correct Answer - A

Ans. is 'a' i.e., E Coli 0157/H7

- The majority of HUS in children (90%) is related to prototypic diarrhoea associated form, predominately in previously healthy children 6 months to 4 years of age with a peak between 1 and 2 years.
- Shiga toxin-producing E .coli (STEC) is the major cause of diarrhoea associated with HUS.
- Specifically, E coli with serotype 0157:H7 is the bacteria most commonly associated with HUS (90%) and is the most virulent.
Other common bacteria implicated in the causation of HUS are :
- Shigella dysenteriae
- Salmonella typhi
- Campylobacter jejuni
- Yersinia species
- Pseudomonas species
- Clostridium difficile

370. Koch's postulate is fulfilled by all except

a) M.tuberculosis

b) E.coli

c) T. pallidum

d) None

Correct Answer - C

Ans. is 'c' i.e., T. pallidum

Koch postulates

- Robert Koch proposed a series of postulates that have been applied broadly to link many specific bacterial species with particular disease.
- Koch's postulates are :
 1. The microorganism should be found in all cases of the disease in question and its distribution in the body should be in accordance with the lesions observed.
 2. The microorganism should be grown in pure culture in vitro (or outside the body of the host) for several generations.
 3. When such a pure culture is inoculated into susceptible animal species, the typical disease must result.
 4. The microorganism must again be isolated from the lesions of such experimentally produced disease.
- Microorganisms that do not meet the criteria of Koch's postulates
 1. Mycobacterium leprae (leprosy) → Can not be cultured in vitro
 2. Treponema pallidum (syphilis) → Neisseria gonorrhoeae
 3. No animal model for experimental infection
- Microorganism that partially satisfy the postulates
- E. coli induced diarrhea

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371. Inclusion body containing glycogen is seen in ?

a) Chlamydia trachomatis

b) Chlamydia pneumoniae

c) Chlamydia psittaci

d) All of the above

Correct Answer - A

Ans. is 'a' i.e., Chlamydia trachomatis

Characteristics of the chlamydia

	C trachomatis	C pneumoniae	C psittaci
Inclusion morphology	Round, vacuolar	Round, dense	Large, variable shape, dense
Glycogen in inclusions	Yes	No	No
Elementary body morphology	Round	Pear-shaped, round	Round
Susceptible to sulfonamides	Yes	No	No
DNA homology to C pneumoniae	< 10%	100%	< 10%
Plasmid	Yes	No	Yes
Serovars	15	1	> 4
Natural host	Humans	Humans	Birds
Mode of transmission	Person to person, mother to infant	Airborne person to person	Airborne bird excreta to humans

Major diseases	Trachoma, STDs, infant pneumonia, lymphogran- uloma venereum	Pneumonia, bronchitis, pharyngitis, sinusitis	Psittacosis, pneumonia, fever of unexplained origin
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372. Cytolytic activity of membrane attack complex is modulated by ?

a) Factor I

b) Factor B

c) Factor S

d) Factor H

Correct Answer - C
Ans. is 'c' i.e., Factor S

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373. Most common type of HPV associated with cervical cancer ?

a) 6, 11

b) 5, 8

c) 16, 18

d) 6, 8

Correct Answer - C

Ans. is 'c' i.e., 16, 18

- HPV DNA of oncogenic types (High risk) in HPV-16, 18, 31, 33 and 45 → associated with cervical cancer
- HPV-6 and 11 (Low risk HPV) → associated with precursor lesions of cervical cancer (CIN) and Condyloma Acuminatum.
- In patients with epidermodysplasia verruciformis, Squamous cell cancer develop frequently at sites infected with specific HPV types, including 5 and 8.
- E6 and E7 genes of HPV are responsible for carcinogenicity.

374. Frie's test is useful for diagnosis of ?

a) Mycoplasma

b) Rickettsia

c) Sarcoidosis

d) Chlamydia

Correct Answer - D

Ans. is 'd' i.e., Chlamydia

- Fries test (skin hypersensitivity test) was used for LGV (caused by chlamydia trachomatis).
- But it is not used now because of high false positive results.

375. Which of the following is an intermediate level disinfectant ?

a) 2% glutaraldehyde

b) Ethylene oxide

c) Hypochlorite

d) None

Correct Answer - C

Ans. is 'c' i.e., Hypochlorite

Levels of disinfections

Levels of disinfection	Items	Time	disinfectant
High level	Critical and semi critical items (except thermometers and hydrotherapy tanks)	≥ 20 min. (sterilization X, then HLD)	Glutaraldehyde, Hydrogen peroxide, peracetic acid, peracetic acid with hydrogen peroxide, chlorines
Intermediate level	Semicritical and noncritical (except environmental surfaces)	≤ 10 min.	Alcohols, Iodophors, Phenolics, chlorines
Low level (environmental surfaces)	Noncritical		Alcohols, Iodophors, Phenolics, chlorines

376. Infective form of *T. brucei* ?

a) Amastigote

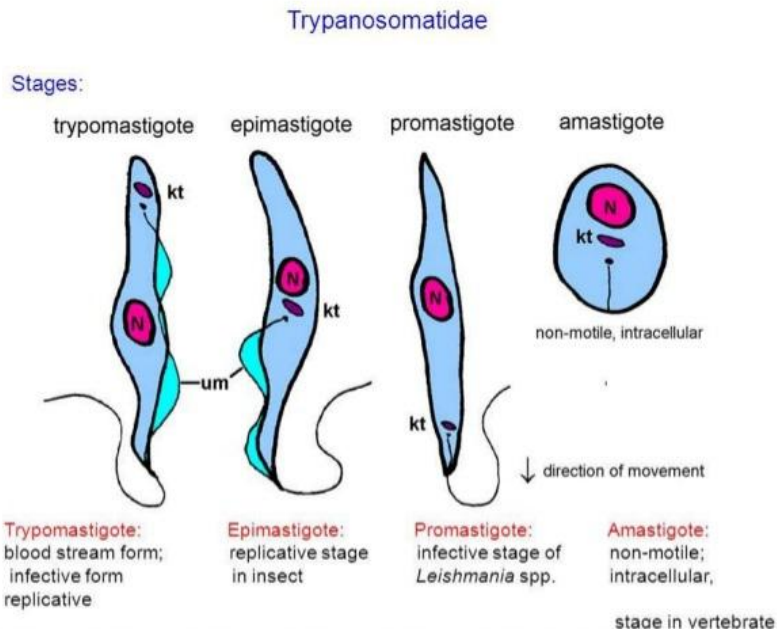
b) Trypomastigote

c) Egg

d) None

Correct Answer - B

Ans. is 'b' i.e., Trypomastigote



<https://image.slidesharecdn.com/trypanosomaseminar1-170312074241/95/trypanosoma-1-4-638.jpg?cb=1489304612>

377. Staining method used for mycoplasma ?

a) Fontona method

b) Laviditti method

c) Dienes method

d) None

Correct Answer - C

Ans. is 'c' i.e., Dienes method

- Colonies of mycoplasma may be seen with a hand lens but are best studied after staining by Dienes method.
- For this, a block of agar containing the colony is cut and placed on a slide.
- It is covered with a cover slip on which an alcoholic solution of methylene blue and azure has been dried

378. Innate immunity involves ?

a) T-cells

b) B-cells

c) Macrophages

d) Antibodies

Correct Answer - C

Ans. is 'c' i.e., Macrophages

Macrophages and neutrophils are phagocytic cells that engulf a microbial pathogen after it has been identified by the innate immune system

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379. Golden yellow jelly fungus is ?

- a) T tursurans
- b) T montegrophytes
- c) Tremella mesenterica
- d) E floccosum

Correct Answer - C

Ans. is 'c' i.e., Tremella mesenterica

- The term jelly fungus is sometimes applied to any fungus with a jelly like fruiting body, but it is especially appropriate for the members of a group of taxa traditionally assigned to the order Tremellales.
- Largest genus is Tremella, which consists of about 80 species.
- Tremella mesenterica (witches butter) is a commonly encountered species which has orange to golden yellow fruiting bodies. Therefore it is also called as *golden yellow jelly fungus* or *yellow brain* or *yellow trembler*.

380. Macrophage tropic strains of HIV use ?

a) CCR5

b) CXCR4

c) CCR4

d) None

Correct Answer - A

Ans. is 'a' i.e., CCR5

Receptors for HIV

- The receptor for the virus is CD4 antigen, and therefore the virus may infect any cell bearing the CD4 antigen on the surface this is primarily the CD4 + (Helper) T Lymphocyte
- Specific binding of virus to CD4 receptor is by the envelope glycoprotein gp-120. However, for infection to take place, cell fusion is essential, which is brought about by the transmembrane gp41.
- Entry of virus into the cells also requires coreceptor molecule :-
T cell CXCR4
Macrophage CCR5

381. ABO isoantibodies are of which class

a) IgG

b) IgM

c) IgD

d) IgA

Correct Answer - B

Ans. is 'b' i.e., IgM

- The ABO antigens represent carbohydrate moieties present on erythrocytes.
- Individual naturally develop antibodies (called isoantibodies), usually of IgM isotype, specific for ABO antigens that do not express.
- If the individual receives a transfusion of blood that contains incompatible ABO antigens, isoantibodies will cause agglutination of donor cells.
- This process is called as isohemagglutination, the antigens are called isohemagglutinins.
- Also remember
- Anti-Rh antibodies are of IgG class

382. A 4 year old child presents with acute watery diarrhea and abdominal cramps. Stool microscopy reveals trophozoites with falling leaf motility. The etiological agent is ?

a) Entamoeba histolytica

b) Giardia lamblia

c) Trichomonas tenax

d) Balantidium coli

Correct Answer - B

Ans. is 'b' i.e., Giardia lamblia

- In acute giardiasis trophozoites show the typical "falling-leaf" motility in wet mount examination of faeces. Diagnosis of giardiasis?
- The gold-standard for diagnosis of giardiasis is microscopic demonstration of trophozoite or cyst or both in faeces.
- In acute giardiasis trophozoites show the typical "falling-leaf" motility in wet mount examination of faeces.
- The characteristic shape and two nuclei are seen after staining a thin faecal smear with Field's stain.
- Trophozoites are also present in duodenal fluid. Duodenal fluid can be either aspirated or obtained by "String test" (Enterotest) for examination.
- Cysts of G. lamblia are often shed in the faeces in "Showers", meaning that many cysts may be passed on a day and none on the other. Hence, to detect cyst-passers multiple-sample are to be examined, preferably following concentration techniques like zinc

sulphate floatation or formal detergent concentration technique.

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383. The hookworm thrives on ?

a) Whole blood

b) Plasma

c) Serum

d) RBC

Correct Answer - B

Ans. is 'b' i.e., Plasma

Hook worms

Ancylostoma duodenale → Old world hookworm

Nector americanus → New world hook worm

Habitat → Small intestine (Jejunum > duodenum > Ileum)

Infective form → Filariform larva

Mode of infection → Penetration of skin

- Plasma forms the main source of nourishment for hookworm, the red blood cells pass out from the worm practically unchanged into the lumen of host's intestine.

384. Infective form of Hookworms ?

a) Egg

b) Rhabditiform larva

c) Filariform larva

d) None

Correct Answer - C

Filariform larva

- Eggs are passed in the stool, and under favorable conditions (moisture, warmth, shade), larvae hatch in 1 to 2 days.
- **The released rhabditiform larvae grow in the feces and/or the soil, and after 5 to 10 days (and two molts) they become filariform (third-stage) larvae that are infective .**

385. All are non-sporing anaerobes of medical importance except

a) Actinomyces

b) Bacteroides

c) Clostridia

d) Fusobacterium

Correct Answer - C
Ans. is 'c' i.e., Clostridia

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386. The number of bacteria on skin are

a) $10^1 - 10^2$

b) $10^2 - 10^5$

c) $10^5 - 10^{10}$

d) $>10^{10}$

Correct Answer - D

Ans. is 'd' i.e., $>10^{10}$

- It has been calculated that a human adult has about 10^{12} bacteria on the skin.

387. The number of bacteria per cm of skin are ?

a) 10^1 - 10^2

b) 10^2 - 10^3

c) 10^5 - 10^{10}

d) $>10^1$

Correct Answer - B

Ans. is 'b' i.e., 10^2 - 10^3

- Density of bacterial population at most sites is between 100-1000 per square cm.

388. Which Passive immunity is also provided through colostrum and breast milk?

a) IgG

b) IgA

c) IgE

d) IgM

Correct Answer - B

Ans. B. IgA

Passive immunity is also provided through **colostrum and breast milk**, which **contain IgA antibodies** that are transferred to the gut of the infant, providing local protection against disease-causing bacteria and viruses until the newborn can synthesize its own antibodies. Protection mediated by IgA is dependent on the length of time that an infant is breastfed, which is one of the reasons the World Health Organization recommends breastfeeding for at least the first two years of life.

389. Which of the following cell types are the most potent activator of T-cell ?

- a) Bell
- b) Follicular Dendritic Cells
- c) Mature dendritic cells
- d) Macrophages

Correct Answer - C

Ans. (c) Mature Dendritic cells *Ref. Robins 8/e, p 192, Harrison 18/e, p 2657*

"Mature dendritic cells are the most potent activator of naive T-cell"

Dendritic Cells:

- Bone marrow derived cells
- There are two types of cells with dendritic morphology:
 - Interdigitating dendritic cells
 - Follicular dendritic cells

Interdigitating dendritic cells or just dendritic cells are the most important antigen presenting cells for initiating primary immune response against protein antigens. This is due to following reasons:

- These cells are located at the right place to capture antigens , i.e. under epithelia, in the interstitial of all tissue.
- They express variety of receptors (including TLR, mannose) for capturing microbes.
- In response to microbes dendritic cells express the same chemokine receptors as to naive T-cells.
- They express high levels of MHC class II molecules as well as co-stimulatory molecules B.7-1 and B.7-2. Or in other words they possess all the machinery needed for presenting antigens to and activating CD4 + T cells.

On the other hand *follicular dendritic cells* (does not arise from bone marrow) are present in the germinal centres of lymphoid follicles where they trap antigens bound to antibodies or complement.

Follicular dendritic cells plays a role in ongoing immune response by presenting antigens to B-cells and selecting the B-cells that have the highest affinity for the antigen.

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390. Prozone phenomenon is due to

- a) Antigen excess
- b) Antibody excess
- c) **False +ve** reaction
- d) False -ve reaction

Correct Answer - B:D

Ans. (b) and (d) Antibody excess and False-negative *Ref.*

Ananthanarayan 8/e, p 104, 9/ 105

Zone phenomenon (seen in agglutination and precipitation) consists of 3 parts:

1. Prozone = Ab excess = weak or absent precipitation reaction = False -ve
2. Zone of equivalence = peak amount of precipitation.
3. Post zone = Ag excess = weak or absent precipitation reaction.

391. Which of the following Staphylococcal infection is not toxin mediated:

a) Toxic shock syndrome

b) Scalded skin syndrome

c) Food poisoning

d) Septic shock

Correct Answer - D

Ans. is (d) Septic shock

Toxin mediated illness of S.

Disease	Toxin involved
- Toxic shock syndrome	Toxic shock syndrome toxin
- Food poisoning	Enterotoxin
- Staphylococcal scalded skin syndrome	Exfoliative/epidermolytic toxin

Note: Septic shock is due to bacteremia.

392. True about interferon is:

a) It is a synthetic antiviral agent

b) Inhibits viral replication in cells

c) Is specific for particular virus

d) None

Correct Answer - B

Ans. (b) Inhibits viral replication in cells

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- Interferon (host coded protein) has no direct action on viruses but inhibit viral replication by selectively inhibiting translation of viral m-RNA without affecting cellular m-RNA.
- IFN are not virus specific but species specific.
- It is of 3 types:

Type

target

IFN α (protein) or leukocyte

IFN All cells

Cell source. Cell

Biological activity

All cells Antiviral activity; stimulates T L.ell, macrophages and NK cell activity

IFN β (glycoprotein) or Fibroblast IFN

All cells All cells Direct antitumor effects

Upregulates MHC class I antigen expression. Used thereapeutically in viral and autoimmune disease

• *IFNγ (glycoprotein) or T cells immune IFN*

All cells

Regulates macrophage and NK cells activation

NK

Stimulates Ig secretion by B

cells

cells Induction of class II
histocompatibility antigens
TH1 T cell differentiation

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393. Protein A of staphylococcus binds to

a) IgA

b) IgG

c) IgD

d) IgE

Correct Answer - B
Ans. is. b. IgG

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394. Test to differentiate staphylococci from micrococci:

a) Catalase test

b) Coagulase test

c) Novobiosin sensitivity

d) Oxidation fermentation

Correct Answer - D
Oxidation fermentation

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395. Most common site for staphylococcus carrier:

a) Skin

b) Nose

c) Oropharynx

d) Perineum

Correct Answer - B

Ans. is. b. Nose

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396. Crystal violet blood agar is used for which bacteria?

a) *Corynebacterium diphtheriae*

b) *Staph aureus*

c) β -hemolytic streptococcus

d) Meningococcus

Correct Answer - C

β -hemolytic streptococcus

Crystal violet blood agar is a selective medium for isolation of β -hemolytic group-A streptococcus.

o Crystal violet permits the growth of streptococcus but inhibits growth of other gram positive bacteria (including staphylococcus)

397. Which streptodornase is most antigenic in human beings:

a) A

b) B

c) C

d) D

Correct Answer - B

Ans. is. b. B

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398. A chronic alcoholic is presenting with clinical features of meningitis. Most likely organism which will grow on CSF culture:

a) *Streptococcus pneumoniae*

b) *N. meningitidis*

c) *Listeria monocytogenes*

d) *E. coli*

Correct Answer - A
Streptococcus pneumoniae

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399. Heating at 60°C for 30 minute would isolate:

a) Staphylococci

b) Enterococci

c) Micrococci

d) Streptococci

Correct Answer - B
Enterococci

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400. Which of the following can be used for obtaining specimen for isolation of microorganism in laboratory diagnosis:

a) Meningococcal rash

b) Blood in staphylococcal food poisoning

c) Throat swab in Rheumatic fever

d) Blood in post-streptococcal GN

Correct Answer - A

Ans. is. a' i.e. Meningococcal rash

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401. T cells in lymph node are present in:

a) Paracortical area

b) Mantle layer

c) Medullary cords

d) Cortical follicles

Correct Answer - A

Ans. a. Paracortical area

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402. Membrane attack complex (MAC) in complement system is:

a) C3b

b) C13

c) C5₉

d) C24

Correct Answer - C

Ans. c. C5₉

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403. Complement components are:

a) Lipids

b) Proteins

c) Lipoproteins

d) Polysaccharide

Correct Answer - B

Ans. b. Proteins

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404. Which is not true about macrophages:

- a) Activation by IFN- γ
- b) Major cells in chronic inflammation
- c) M₂ type involved in inflammation
- d) Phagocytic cells

Correct Answer - C

Ans. c. M₂ type involved in inflammation

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405. Not true about gas gangrene:

- a) Most common cause is *C. perfringens*
- b) Extensive necrosis of muscles
- c) *C. perfringens* produce heat-labile spores
- d) Metronidazole is the drug of choice

Correct Answer - D

Ans. is. 'd' i. e. Metronidazole is the drug of choice

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406. Naegler's reaction is due to:

- a) Coagulase
- b) Hyaluronidase
- c) Lecithinase
- d) None of the above

Correct Answer - C
Ans. is. 'c' i. e. Lecithinase

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407. True about corynebacterium diphtheriae:

a) All types produce toxin

b) Toxin production is dependent upon critical concentration of iron

c) Heat stable toxin

d) Inhibit cAMP

Correct Answer - B

Ans. is. 'b' i. e. Toxin production is dependent upon critical concentration of iron

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408. Not true about *Corynebacterium hormannii*

- a) A diphtheroid
- b) Non-pathogenic saprophyte
- c) Toxigenic
- d) Also known as *C. pseudodiphthericum*

Correct Answer - C
Ans. is. 'c' i. e. Toxigenic

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409. Ehrlichia chaffeensis is causative agents of

a) HME

b) HGE

c) Glandular fever

d) None

Correct Answer - A

Ans. a. HME

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410. All are true about chromobacteritun violaceum except?

- a) Gram negative
- b) Produces violet-colored pigment
- c) Normal flora in human
- d) Causes cellulitis

Correct Answer - C

Ans. c. Normal flora in human

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411. Capsid of viral structure is:

- a) Extracellular infectious particle
- b) Protein coat around nucleic acid
- c) Envelop around a virus
- d) None of the above

Correct Answer - B

Ans. b. Protein coat around nucleic acid

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412. True about anthrax toxin are all except:

a) Has three fractions

b) Increase cAMP

c) Coded by plasmid

d) Inhibits protein synthesis

Correct Answer - D

Ans. is. 'd' i. e. Inhibits protein synthesis

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413. Regarding fungal cell wall all are true except:

a) Contains chitin

b) Prevent osmotic damage

c) Azoles act on them

d) Does not contain peptidoglycan

Correct Answer - C

Ans. c. Azoles act on them

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414. Capsule of *Bacillus anthracis* is formed of:

a) Polysaccharide

b) Lipopolysaccharide

c) Polypeptide

d) Long chain fatty acids

Correct Answer - C

Ans. is. 'c' i. e. Polypeptide

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415. A child is presenting with vomiting and abdominal pain after 5 hours of eating some food. The most likely causative organism:

a) *Bacillus cereus*

b) *Cl. perfringens*

c) *Cl. botulinum*

d) *V. cholerae*

Correct Answer - A

Ans. is. 'a' i. e. *Bacillus cereus*

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416. All are true about listeria except:

- a) Gram positive
- b) PALCAM agar is used for isolation
- c) Characteristic tumbling motility at 37°C
- d) Umbrella shaped growth

Correct Answer - C

Ans. is. 'c' i. e., Characteristic tumbling motility at 37°C

- *L. monocytogenes* is a gram-positive coccobacillus (coccoid rod) with a tendency to occur in chains.
- Peritrichous flagella are produced by the bacillus optimally at 20-30°C but only scantily or not at all at 37°C
- Culture media used for isolation are blood agar, chocolate agar, and PALCAM agar.
- It grows on ordinary media within a temperature range of 1° to 45°C.
- Most cases of human disease are caused by serotypes 1/2a, 1/2b and 4b.
- The organism can be found as a part of the gastrointestinal flora in healthy individuals.
- Human disease due to *L. monocytogenes* generally occurs in the setting of pregnancy or immunosuppression.

417. *Listeria* resists phagocytosis in phagosomes (phagolysosomes) due to:

- a) β -hemolysin
- b) Caspases
- c) Cell membrane adhesion molecules
- d) Opacity associated protein (OAP)

Correct Answer - A

Ans. is. 'a' i. e., β -hemolysin

Most important step in pathogenesis of listeriosis is the survival and multiplication of *L. monocytogenes* in phagocytes (macrophages), host epithelial cells and hepatocytes.

* The most important determinant of pathogenesis is listeriolysin O (LLO), a β -hemolysin. LLO causes lysis of membrane of phagosomes within phagocytes and helps in intracellular survival of *L. monocytogenes*.

* Iron is an important virulence factor. *Listeria* produce siderophores and are able to obtain iron from transferrin. Immunity to *Listeria* is primarily cell mediated. Immunity can be transferred by sensitized lymphocytes but not by antibodies.

418. Renauld Braud phenomenon is seen is:

a) Candida albicans

b) Candida pscitasi

c) Histoplasma

d) Cryptococcus

Correct Answer - A
Ans. a. Candida albicans

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419. Reactive tubercular arthritis:

a) Spina ventusa

b) Pott's disease

c) Poncet's disease

d) None

Correct Answer - C

Ans. is. 'c' i. e. Poncet's disease

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420. XDR-TB is defined as Resistance to:

- a) INH plus rifampicin
- b) Fluoroquinolones plus INH plus amikacin
- c) Fluoroquinolones plus rifampicin plus kanamycin
- d) Fluoroquinolones plus INH plus rifampicin plus amikacin

Correct Answer - D

Ans. is. 'd' i. e., Fluoroquinolones plus INH plus rifampicin plus amikacin

- *Extensive drug resistance TB (XDR - TB) is referred to resistance to rifampicin and isoniazid as well as to quinolone and at least one of the following second line drug kanamycin, capreomycin or amikacin. XDR - TB = resistance to INH, rifampicin, Quinolone, and capreomycin/kanamycin/ amikacin*

421. Modified Ziehl-neelsen staining is used for:

a) Mycobacterium tuberculosis

b) Mycobacterium bovis

c) Nocardia

d) All of the above

Correct Answer - D

Ans. is. 'd' i. e., All of the above

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422. Hansen's bacillus is cultured in:

a) L J medium

b) Robertson's cooked meat medium

c) Foot pad of mice

d) Sabraud's agar

Correct Answer - C

Ans. is. 'c' i. e., Foot pad of mice

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423. Primary complex of M bovis involves:

a) Tonsil and lung

b) Tonsil and intestine

c) Tonsil and skin

d) Skin and Intestine

Correct Answer - B

Ans. is. 'b' i. e., Tonsil and intestine

Ans. is. 'b' i. e., Tonsil and intestine

Primary complex of M tuberculosis (infection by inhalation)

i) Lung lesion

ii) Enlarged hilar lymph nodes

o Primary complex of M bovis (infection by drinking milk)

i) Tonsil

ii) Cervical nodes or intestine (ileocecal region and mesenteric lymph nodes)

424. Phagocytosis of mycobacterium tuberculosis by macrophages is mainly mediated by:

a) IL 6

b) IL 3

c) IL 12

d) IFN Gamma

Correct Answer - D
Ans. is. 'd' i. e., IFN Gamma

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425. Toxoplasma in children causes:

a) Chorioretinitis

b) Conjunctivitis

c) Keratitis

d) Papillitis

Correct Answer - A

Ans. a. Chorioretinitis

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426. True about widal test:

- a) Anti-O antibody persists longer
- b) O antigen of *S. paratyphi* is used
- c) H-antigen is most immunogenic
- d) Felix tube is used for 'H' agglutination Inar

Correct Answer - C

Ans. is. 'c' i. e., H-antigen is most immunogenic

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427. Not true about Vi polysaccharide vaccine of typhoid:

- a) Single dose is given
- b) Revaccination at 3 years
- c) Given at birth
- d) Given subcutaneously

Correct Answer - C
Ans. is. 'c' i. e., Given at birth

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428. Salmonella and shigella can be differentiated from other enterobacteriaceae member by isolation on:

a) MacConkey agar

b) Mannitol salt agar

c) BCYE medium

d) XLD agar

Correct Answer - D

Ans. is. 'd' i. e. XLD agar

XLD (xyloseLysine deoxycholate) agar is a selective differential medium for isolation of Gram-negative enteric pathogens from fecal specimens and other clinical material.

o It is especially suitable for the isolation of shigella and salmonella species

429. Clinical significance of Vi antigen of *S. typhi* is:

- a) Helps in diagnosis
- b) Highly immunogenic
- c) Most important antigen for widal test
- d) Antibody against Vi-antigen is used for diagnosis of carrier

Correct Answer - D

Ans. is. 'd' i. e., Antibody against Vi-antigen is used for diagnosis of carrier

430. Proteus isolated from a patient of UTI will show which biochemical reaction:

a) Phenylpyruvic acid reaction

b) Bile esculin reaction

c) Colchicine sensitivity

d) Bacitracin sensitivity

Correct Answer - A

Ans. is. 'a' i. e., Phenylpyruvic acid reaction

st of them except providencia strains, produce powerful urease.

--> A characteristic feature of proteus bacilli is "PPA reaction"

--> It is due to presence of enzyme phenylalanine deaminase which converts phenylalanine to phenylpyruvic acid

431. Hebra nose is caused by:

a) Frisch bacillus

b) Staph aureus

c) Pseudomonas

d) C. diphtheriae

Correct Answer - A

Ans. is. 'a' i. e., Frisch bacillus

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432. Amoebiasis is not transmitted by:

a) Feco-oral route

b) Sexual transmission

c) Blood and blood products

d) Vector transmission

Correct Answer - D

Ans. d. Vector transmission

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433. Trypanosoma cruzi is transmitted by:

a) Tse tse fly

b) Reduviid bug

c) Culex mosquito

d) Sand fly

Correct Answer - A
Ans. a. Tse tse fly

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434. Absence of Vi-antibody in a typhoid patient has:

a) Good prognosis

b) Bad prognosis

c) No relation with prognosis

d) Indicates widal negative

Correct Answer - B

Ans. is. 'b' i. e., Bad prognosis

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435. Duodenal aspirate is used in diagnosis of:

a) *E histolytica*

b) *Giardia lamblia*

c) *Taenia solium*

d) *Leishmania*

Correct Answer - B

Ans. b. *Giardia lamblia*

Duodenal aspirate is used for *G lamblia*, *O. sinensis*, *F. hepatica*, and *S. stercoralis*.

436. Recrudescences are commonly seen in which malaria:

a) P vivax

b) P ovale

c) P malariae

d) P falciparum

Correct Answer - D
Ans. d. P falciparum

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437. Charcot Leyden crystal in stool is seen in:

a) Amoebic dysentery

b) bacillary dysentery

c) Shigella

d) bacillus cereus

Correct Answer - A
Ans. a. Amoebic dysentery

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438. Bacteria that can grow even in the presence of antiseptic:

a) Staphylococcus

b) Streptococcus

c) E. coli

d) Pseudomonas

Correct Answer - D

Ans. is. 'd' i. e., Pseudomonas

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439. Which of the following is non-motile:

a) *Pseudomonas aeruginosa*

b) *Burkholderia mallei*

c) *Burkholderia pseudomallei*

d) None of the above

Correct Answer - B

Ans. is. 'b' i. e., *Burkholderia mallei*

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440. Pneumonic plague is spread by:

- a) Bite of infected flae
- b) Direct contact with infected tissue
- c) Ingestion of contaminated food
- d) Droplet infection

Correct Answer - D
Ans. is. 'd' i. e., Droplet infection

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441. Izumi fever is caused by:

a) *Pseudomonas aeruginosa*

b) *Burkholderia mallei*

c) *Yersinia pseudotuberculosis*

d) *Pasteurella multocida*

Correct Answer - C

Ans. is. 'c' i. e., *Yersinia pseudotuberculosis*

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442. Schistosomiasis is an exmple of:

a) Meta-zoonoses

b) Cyclo-zoonoses

c) Direct-zoonoses

d) Sporo-zoonoses

Correct Answer - A
Ans. a. Meta-zoonoses

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443. True about diphyllbothrium:

- a) Man is single host
- b) Iron deficiency anemia is seen
- c) Operculated egg is diagnostic
- d) Fish is the definitive host

Correct Answer - C
Ans. c. Operculated egg is diagnostic

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444. Unsegmented eggs are in which parasite?

a) *Trichuris trichura*

b) *Ancylostoma*

c) *Necator americanus*

d) *Dracunculus*

Correct Answer - A

Ans. a. *Trichuris trichura*

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445. Flame cells are seen in:

a) Protozoa

b) Cestode

c) Nematodes

d) None

Correct Answer - B

Ans. b. Cestode

Flame cell (also called solenocyte) is the excretory cell in *cestodes* and *trematodes*, the number and arrangement of which is used as a basis for identification.

The cell has a tuft of cilia, whose beating resembles the flickering of a flame.

The flame cells open into a collecting tubule.

446. Cholangiocarcinoma is caused by:

- a) Giardia lamblia
- b) Clonorchis **infestation**
- c) Paragonimus infestation
- d) Ascaris infestation

Correct Answer - B
Ans. b. Clonorchis infestation

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447. Brazilian purpuric fever is caused by:

- a) Bordetella pertussis
- b) Haemophilus aegypticus
- c) Haemophilus duceryi
- d) Haemophilus parainfluenzae

Correct Answer - B

Ans. is. 'b' i. e., Haemophilus aegypticus

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448. Granuloma inguinale is caused by:

a) *H. ducreyi*

b) *Chlamydia trachomatis*

c) *Treponema pallidum*

d) *Calymmatobacterium*

Correct Answer - D

Ans. is. 'd' i. e., *Calymmatobacterium*

Granuloma lenerutn (granuloma inguinal) --> *Calymmatobacterium*

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449. Pseudobubo seen in:

a) Chancroid

b) Syphilis

c) Lymphogranuloma inguinale

d) Lymphogranuloma venerum

Correct Answer - C

Ans. is. 'c' i. e., Lymphogranuloma inguinale

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450. Pontiac fever is caused by:

a) Legionella

b) Listeria

c) Scrub typhus

d) Leptospira

e) Rickettsia

Correct Answer - A

Ans. (a) Legionella

Pontiac fever is a mild nonfatal influenza like illness caused by *Legionella pneumophila*.

Pontiac fever is,

- An acute self limiting flu like illness with IP of 24-48 hours
- Malaise, fatigue and myalgia are the most frequent presenting symptoms
- Pneumonia doesn't develop.
- Complete recovery takes place, without antibiotic therapy.
- Diagnosis is established by antibody detection.

451. True about legionella:

- a) Most common mode of transmission is aerosol inhalation
- b) There is no man to man transmission
- c) Prolonged carrier are common
- d) All are true

Correct Answer - B

Ans. is. 'b' i. e., There is no man to man transmission

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452. Congenital varicella infection causes all except:

a) Macrocephaly

b) Limb hypoplasia

c) Cortical atrophy

d) **Cicatrix**

Correct Answer - A
Ans. a. Macrocephaly

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453. Which pox wont grow in egg, animal cells:

a) Cow pox

b) Vaccinia

c) Variola

d) **Molluscum**

Correct Answer - D

Ans. d. Molluscum

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454. Diagnosis of rotavirus is by:

a) Stool antigen

b) Stool antibody

c) Stool culture

d) Blood antibody

Correct Answer - A

Ans. is 'a' i.e., Stool antigen [Ref: Hanison 18n/e p. 1591, 1592; Greenwood 1&/e p. 5251]

- In Rotavirus diarrhoea, large no. of viruses are shed in faeces (at the peak of the disease, as many as 10¹¹ virus particles can be detected per ml of feces). These viruses can be easily detected by the following methods:

i) Enzyme immunoassay (ELISA)

It offers approximately 90% specificity & sensitivity for detection of virus in stools.

ii) Latex agglutination

iii) Immune electron microscopy

--> Viral shedding detectable by these methods usually subsides within a week

--> Virus in stools can be detected for longer periods by using techniques for detecting viral RNAs, such as PCR, Gel electrophoresis, probe hybridization.

455. Which of the following belongs to Herpesviridae:

a) Variola

b) Adenovirus

c) HPV

d) RK virus

Correct Answer - D

Ans. d. RK virus

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456. Which is not a poxvirus:

a) Vaccinia virus

b) Molluscum contagiosum

c) Tanapox virus

d) Coxsackie virus

Correct Answer - D

Ans. d. Coxsackie virus

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457. True about chlamydia are all except:

- a) Obligate intracellular organism
- b) Gram positive
- c) Reticulate body is metabolically active
- d) Replicate by binary fission

Correct Answer - B

Ans. is. 'b' i. e., Gram positive

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458. Indian tick typhus is caused by:

a) R typhi

b) R conorii

c) R akari

d) C burnetii

Correct Answer - B

Ans. is. 'b' i. e., R conorii

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459. Chlamydia pneumoniae causes causes:

a) LGV

b) Atherosclerosis

c) Inclusion conjunctivitis

d) Trachoma

Correct Answer - B

Ans. is. 'b' i. e., Atherosclerosis

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460. Bartonella quintana causes:

a) Trench fever

b) Scrub typhus

c) Endemic typhus

d) Epidemic typhus

Correct Answer - A

Ans. is. 'a' i. e., Trench fever

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461. What is trench fever:

a) Q-fever

b) 5-days fever

c) Boutonneuse fever

d) Indian tick typhus

Correct Answer - B

Ans. is. 'b' i. e., 5-days fever

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462. Brill-Zinsser disease is:

- a) Recrudescence of R prowazekii infection
- b) Recrudescence of R typhi infection
- c) Recrudescence of R conorii infection
- d) None

Correct Answer - B

Ans. is. 'b' i. e., Recrudescence of R typhi infection

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463. Eschar is seen in all the Rickettsial diseases except:

a) Scrub typhus

b) Rickettsial pox

c) Indian tick typhus

d) Endemic typhus

Correct Answer - D

Ans. is. 'd' i. e., Endemic typhus

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464. Bubus form is which stage of LGV:

a) Primary

b) Secondary

c) Tertiary

d) Latent

Correct Answer - B

Ans. is. 'b' i. e., Secondary

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465. Leptospirosis is transmitted by:

a) Rat

b) Cat

c) Dog

d) Fish

Correct Answer - A

Ans. is. 'a' i. e., Rat

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466. Vincent's angina is caused by *Borrelia vincentii* along with:

a) *Lactobacillus*

b) *Lactobacillus*

c) *Fusobacterium*

d) *Bacteroides*

Correct Answer - C
Ans. (c) *Fusobacterium*

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467. Most common form of leptospirosis:

a) Weil's disease

b) Icteric form

c) Hepatorenal form

d) Anicteric form

Correct Answer - D

Ans. (d) Anicteric form

It is most common (90%) and mild form. Most common finding is fever with conjunctival suffusion

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468. Colorado Tic fever is caused by:

a) Filoviridae

b) Reoviridae

c) Coronaviridae

d) Calciviridae

Correct Answer - B

Ans. b. Reoviridae

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469. Medium used for antibiotic sensitivity:

- a) CLED agar
- b) Hektoen agar
- c) Mueller-Hinton agar
- d) Salt milk agar

Correct Answer - C

Ans. is. 'c' i. e., Mueller-Hinton agar

Antibiotic sensitivity testing

Antibiotic sensitivity testing is carried out to determine appropriate antibiotic to be used for a particular strain isolated from clinical specimens.

Antibiotic testing can be carried out by two broad methods :

a) *Disc diffusion tests*

b) *Dilution tests*

A) Disc diffusion tests

- There are *most commonly used* methods to determine antibiotic susceptibility.
- Discs impregnated with known concentration of antibiotics and are placed on the culture medium that has been inoculated with a culture of bacterium to be tested.
- Antibiotic sensitivity is determined by zone of inhibition of bacterial growth around the disc.
- Selection of media
- Medium that supports both test and control strains is selected for carrying out antibiotic susceptibility testing.
- For example:
- *Muller-Hinton agar* is used for gram-negative bacilli and staphylococcus spp.

- *Blood agar* is used for streptococcus spp and enterococcus spp.
 - *Chocolate agar* is used for Haemophilus influenzae
 - *Wellcotest medium* uses antibiotics sulfonamide and cotrimoxazole
- Mueller -Hinton agar is most commonly used medium for antibiotic sensitivity testing* Type of disc diffusion test.
- Disc diffusion tests are following types :?
- i) *Kirby-Bauer disc diffusion method - most commonly used.*
 - ii) *Stoke disc diffusion method*
 - iii) *Primary disc diffusion test*

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470. Sterilization of culture media containing serum is by:

a) Autoclaving

b) Micropore filter

c) Gamma radiation

d) Gamma radiation

Correct Answer - A
Ans. (a) Autoclaving

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471. Incubation period of measles is:

a) 18-72 hours

b) 10-14 days

c) 3-4 days

d) 20-25 days

Correct Answer - B

Ans. b. 10-14 days

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472. Viral DNA is integrated into Bacterial DNA in:

a) Transduction

b) Lysogenic conversion

c) Transformation

d) Conjugation

Correct Answer - B

Ans. (b) Lysogenic conversion

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473. Which influenzae strain, not of human origin and can cause pandemic:

a) H₁ N₁

b) H₂ N₂

c) H₅ N₁

d) H₉ N₁

Correct Answer - C

Ans. c. H₅ N₁

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474. True about influenza vaccine:

- a) Live vaccine is used most commonly
- b) Live vaccine is given by nasal drops
- c) Killed vaccine is given intramuscular in deltoid
- d) All are correct

Correct Answer - B

Ans-B

Live attenuated vaccines--> These are used as nasal drops

Killed vaccine --> It is used most commonly. It is given subcutaneously in 2 doses, 3-4 weeks apart. Protective efficacy is 70-90% and duration of protection is 3-6 months.

475. True about rotavirus vaccine:

a) Killed vaccine

b) Given subcutaneous

c) Pentavalent vaccine

d) Should be given before 5 years

Correct Answer - C

Ans. c. Pentavalent vaccine

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476. Binding of gp 120 causes:

- a) Infection of target cell
- b) Facilitation of co-receptor
- c) Fusing of virus and target cell
- d) None

Correct Answer - B

Ans. b. Facilitation of co-receptor

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477. HIV envelop is formed by:

a) Host cell

b) Virus

c) Both

d) None

Correct Answer - C

Ans. c. Both

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478. Which HIV-virus is more dangerous:

a) HIV-1

b) HIV-2

c) Both are same

d) **It depends on host factors**

Correct Answer - A

Ans. a. HIV-1

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479. Most common mode of transmission of HIV sexual transmission:

a) Blood & blood products

b) Occupational

c) Perinatal

d) Breast feeding

Correct Answer - A

Ans. a. Blood & blood products

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480. Flask shaped ulcers in intestine caused by

- a) Giardia lamblia
- b) Entamoeba histolytica
- c) Helicobacter pylori (H. pylori)
- d) E. vermicularis

Correct Answer - B

Answer B. Entamoeba histolytica

Disease occurs when amoeba comes in contact with the cells lining the intestine.

It then secretes the same substances it uses to digest bacteria, which include enzymes that destroy cell membranes and proteins.

This process can lead to penetration and digestion of human tissues, resulting first in flask-shaped ulcerations in the intestine.

Entamoeba histolytica ingests the destroyed cells by phagocytosis and is often seen with red blood cells (a process known as erythrophagocytosis) inside when viewed in stool samples

481. What type of culture media is used for *Legionella*?

a) (BCYE) agar media

b) MacConkey agar

c) Baird–Parker agar

d) Sabouraud's agar

Correct Answer - A

Answer: A. (BCYE) agar media

BCYE is selective for certain Gram-negative bacteria, especially *Legionella pneumophila*.

The organisms are nutritionally fastidious, non-spore forming, aerobic, gram-negative, slender rods.

Media containing cysteine, yeast extract, α -ketoglutarate, and iron (BCYE) are required for isolation of *Legionella*.

Selective BCYE (medium containing antibiotics), is recommended for specimens likely to be contaminated with other bacteria.

482. Special Stain for cryptococcus :

a) ZN stain

b) Gram stain

c) Mucicarmine stain

d) Malachite green

Correct Answer - C

Ans: C. Mucicarmine stain

Mucicarmine stain provides specific staining of polysaccharide cell wall in *C. neoformans*.

This is limited to microorganisms with a cell wall that is composed, at least in part, of a polysaccharide component.

483. A 36 yrs old male patient c/o cough cold fever/rusty sputum / sputum neg for tb ,h/o of travel in china & eaten crab, Name the infection

a) Paragonimus westermani

b) Fasciola hepatica

c) Fasciolopsis buski

d) Entamoeba histolytica

Correct Answer - A

Ans: A. Paragonimus westermani (lung fluke).

During invasion and migration of the flukes, diarrhea, abdominal pain, fever, cough, urticaria, hepatosplenomegaly, pulmonary abnormalities, and eosinophilia may develop.

Un embryonated eggs are passed in the sputum of a human.

During the chronic phase, the lungs are damaged most, but other organs may be involved.

The clinical picture resembles and is often confused with [TB](#).

Praziquantel is the treatment of choice.

484. Microbiological test for diagnosing leptospira infection?

- a) Cold agglutination
- b) Standard agglutination
- c) Microscopic agglutination test (MAT)
- d) None of these

Correct Answer - C

Answer: C. Microscopic agglutination test (MAT)

- Dark-field microscopy or by immunofluorescence or light microscopy after appropriate staining used
- Microscopic agglutination test [MAT](Gold Standard) also Macroscopic agglutination test
- Differential diagnosis list for leptospirosis is very large due to diverse symptoms.

485. Disc diffusion method is also known as

a) Kirby Bauer

b) VDRL

c) Dark field microscopy

d) None of these

Correct Answer - A

Answer: A. Kirby Bauer

- The disk diffusion test, or agar diffusion test, or Kirby–Bauer test (disc-diffusion antibiotic susceptibility test, disc-diffusion antibiotic sensitivity test, KB test), is a test of the antibiotic sensitivity of bacteria.
- It uses antibiotic discs to test the extent to which bacteria are affected by those antibiotics. In this test, wafers containing antibiotics are placed on an agar plate where bacteria have been placed, and the plate is left to incubate.
- If an antibiotic stops the bacteria from growing or kills the bacteria, there will be an area around the wafer where the bacteria have not grown enough to be visible. This is called a zone of inhibition

486. Rubella virus belongs to which family ?

a) Rheovirus

b) Togavirus

c) Picornavirus

d) Orthomyxo

Correct Answer - B

And. B. Togavirus

Rubella virus (RuV) is the pathogenic agent of the disease rubella, and is the cause of congenital rubella syndrome when infection occurs during the first weeks of pregnancy.

Rubella virus is the only member of the genus Rubivirus and belongs to the family of Togaviridae, whose members commonly have a genome of single-stranded RNA of positive polarity which is enclosed by an icosahedral capsid.

487. Which of the following infection resembles erythroblastosis?

a) EBV

b) CMV

c) HSV

d) STAPHYLOCOCCUS

Correct Answer - B

ANSWER: B. CMV

Cytomegalovirus infection is a common herpesvirus infection with a wide range of symptoms: from no symptoms to fever and fatigue (resembling infectious mononucleosis)

Infection with CMV, like that with Epstein-Barr virus (EBV, a type 4 herpesvirus), can cause a type of infectious mononucleosis in adolescents and young adults. Both CMV and EBV mononucleosis cause fever and fatigue. But EBV also causes a severe sore throat. CMV does not.

488. Diagnostic test for neurosyphilis

a) VDRL

b) RPR

c) TPI

d) FTA-ABS

Correct Answer - A

Answer: A. VDRL

- Examination of CSF for pleocytosis, increase protein concentration, VDRL reactivity.
- A positive CSF VDRL makes the diagnosis of neurosyphilis.
- If both test i.e. VDRL and FTA-ABS IgM (specific) test are positive in the infant then congenital syphilis should be strongly suspected and the child should be treated.
- A positive test confirms neurosyphilis but a negative result does not rule out neurosyphilis. Due to the low sensitivity of the CSF VDRL, fluorescent treponemal antibody absorption test (FTA-ABS) can be used to supplement VDRL.

489. A patient is having gastrointestinal problems including abdominal pain and distension, bloody or mucus-filled diarrhea, and tenesmus, with rectal prolapse. A stool, ova and parasites exam reveals the presence of typical Barrel-shaped eggs, possible causative agent is?

a) Campylobacter

b) Clostridium difficile

c) Giardia lamblia

d) Trichuris

Correct Answer - D

Answer: D. Trichuris

- whipworm can cause gastrointestinal problems, such as abdominal pain, diarrhea, mucous or bloody stools weight loss, painful urination, and weakness.
- Rectal prolapse is a hallmark, albeit rare, symptom of a heavy T. trichiura infection that occurs in children more frequently than adults. When rectal prolapse occurs, worms can often be identified on the edematous rectum.
- In a whipworm infection, the rectum loses its internal support because the worms bury their thin heads into the intestinal lining, loosening the elastic epithelium and weakening the surrounding muscles.

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490. Contact isolation is done for

a) MRSA

b) Mumps

c) Diphtheria

d) Asthama

Correct Answer - C

Answer: C. Diphtheria

- A type of bacteria called *Corynebacterium diphtheriae* causes diphtheria.
- The condition is typically spread through person-to-person contact or through contact with objects that have the bacteria on them, such as a cup or used tissue.
- Even if an infected person doesn't show any signs or symptoms of diphtheria, they're still able to transmit the bacterial infection for up to six weeks after the initial infection
- The bacteria most commonly infect your nose and throat. Once you're infected, the bacteria release dangerous substances called toxins. The toxins spread through your bloodstream and often cause a thick, gray coating in nose, throat, lungs.

491. A child is suffering from recurrent chronic infections with encapsulated bacteria is due to deficiency of subclass

▪

a) IgG1

b) IgG2

c) IgG3

d) IgG4

Correct Answer - B

Answer: B. IgG2

- IgG2 antibodies are predominantly against the polysaccharide (complex sugar) coating (capsule) of certain disease-producing bacteria (such as, *Streptococcus pneumoniae* and *Haemophilus influenzae*).
- In young children, the ability to make IgG2 antibodies to the polysaccharide coatings of bacteria develops more slowly than the ability to make antibodies to proteins.

492. D.O.C for isospora

a) Penicillin G

b) Benzathine penicillin

c) Co-trimoxazole

d) Albendazole

Correct Answer - C

Answer: C. Co-trimoxazole

- The most common antibiotic that is prescribed is co-trimoxazole (trimethoprim-sulfamethoxazole), more commonly known as Bactrim, Septra, or Cotrim.
- For Immunocompetent hosts Preferred regimen: Trimethoprim-sulfamethoxazole 160 mg/800 mg PO bid for 7-10 days..

493. Coxsackievirus A16 causes

- a) Yellow fever
- b) Hand-foot-mouth disease
- c) Rocky mountain spotted fever
- d) Encephalomyocarditis

Correct Answer - B

Answer: B. Hand-foot-mouth disease

- Hand, Foot and Mouth Disease (HFMD) is caused by coxsackie A-16
- The viruses that cause HFMD are spread through close personal contact, through the air from coughing and the feces of an infected person.
- Coxsackievirus A16 is the most common cause, and enterovirus 71 is the second-most common cause. Other strains of coxsackievirus and enterovirus can also be responsible.
- It typically begins with a fever and feeling generally unwell. This is followed a day or two later by flat discolored spots or bumps that may blister, on the hands, feet and mouth and occasionally buttocks and groin.

494. Pneumocystis jirovecii is:

- a) Associated with CMV
- b) Diagnosis is by sputum microscopy
- c) Seen only in immunocompromised patients
- d) Always associated with pneumatocele

Correct Answer - B

Answer: B. Diagnosis is by sputum microscopy

- Human isolate of Pneumocystis which is associated with severe pneumonia in immunocompromised state particularly AIDS.
- P. jirovecii is an extracellular pathogen. Growth in the lung is limited to surfactant layer above alveolar epithelium.
- Serologic evidence suggest that most individuals are infected in early childhood (thus option "c" is wrong) but the pneumonia is seen only in immunocompromised state.
- Diagnosis is made by detection of organism in proper specimen
- Sputum: Quick and non invasive.
- Broncho-alveolar lavage (BAL) fluid: Mainstay of pneumocystis diagnosis.
- Transbronchial biopsy: If diagnosis cannot be made by BAL.

495. All are true about congenital Toxoplasmosis EXCEPT

- a) Chorioretinitis
- b) Conjunctivitis
- c) Hydrocephalus
- d) Cerebral calcification

Correct Answer - B

Answer B. Conjunctivitis

- Occurs only when mother gets primary toxoplasmosis infection whether clinical or asymptomatic during pregnancy or <6 months before conception (i.e. no risk if acquired > 6 months before conception).
- As gestational age is increased, risk of transmission to fetus increased, i.e. max. in 3rd trimester while
- severity of fetal damage is decreased, i.e. infant is usually asymptomatic if infection transmit in 3rd trimester.
- Chorioretinitis is usually treated with a combination of corticosteroids and antibiotics.
- It causes: hydrocephalous, diffuse cerebral calcification,hepatosplenomegaly,mental retardation myocarditis,lymphadenitis,microencephaly, myocarditis, chorioretinitis, multiorgan failure, Pneumonitis

496. true about TRIAD congenital rubella syndrome

- a) PDA, cataract and deafness is seen
- b) Hepatosplenomegaly, mental retardation, deafness
- c) Chorioretinitis, multiorgan failure, pneumonitis
- d) None of these

Correct Answer - A

Answer: A. PDA, cataract and deafness is seen

- Congenital rubella syndrome (CRS) can occur in a developing fetus of a pregnant woman who has contracted rubella, usually in the first trimester. If infection occurs 0–28 days before conception, the infant has a 43% risk of being affected.
- Infection in 2nd trimester – may be deafness only.
- >6 wks – no major abnormalities
- Diagnosis: Isolation of virus in cell cultures of throat samples, urine or other secretions.
- Detection of IgM in single serum sample shortly after birth.
- Persistence of Rubella IgG antibodies serum beyond 1 year or rising antibody titer anytime during infancy in an unvaccinated child

497. Weil felix reaction in scrub typhus is/are positive for:

a) OX -19

b) OX-2

c) Both OX -19 & OX-2

d) OX -K

e) OX -19, OX-2 & OX -K

Correct Answer - D

Ans: d. OX -K [Ref Ananthanarayan 9th/410; Medical Microbiology by Greenwood 16th/373]

- This reaction is an agglutination test in which sera are tested for agglutinins to the O antigens of certain non-motile Proteus strains OX-19, OX-2 & OX-X
- The basis of test is the sharing of an alkali-stable carbohydrate antigen by some rickettsiae & by certain strains of proteus, P. vulgaris OX 19 & OX 2 & P.mirabilis OX K.

disease	OX-19	OX-2	OX-K
Epidemic typhus	+++	+	—
Brill-Zinsser disease	Usually(–ve)or weakly (+ve)		-
Endemic typhus	+++	+/-	-
Tickborne spotted	++	++	-

tever			
Scrub			
typhus	-	-	+++

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498. The correct order of gram staining is

a) Gentian violet → Iodine → Carbol fuchsin

b) Iodine → Gentian violet → Carbol fuchsin

c) Carbol fuchsin → Iodine → Gentian violet

d) Carbol fuchsin → Gentian violet → Iodine

Correct Answer - A

Answer-A- Gentian violet → Iodine → Carbol fuchsin

1. Application of the primary stain (crystal violet). Gentian violet also known as crystal violet stains all cells blue/purple
2. Application of mordant: The iodine solution (mordant) is added to form a crystal violet-iodine (CV-I) complex; all cells continue to appear blue.
3. Decolourization step: The decolourization step distinguishes gram-positive from gram-negative cells. The organic solvent such as acetone or ethanol extracts the blue dye complex from the lipid-rich, thin-walled gram-negative bacteria to a greater degree than from the lipid-poor, thick-walled, gram-positive bacteria. The gram-negative bacteria appear colourless and gram-positive bacteria remain blue.
4. Application of counterstain (safranin): The red dye safranin stains the decolourized gram-negative cells red/pink; the gram-positive bacteria remain blue.

NOTE → If you are struggling to remember the staining reagents used in this procedure and their order you can remember this sentence "Come In And Stain" i.e. the order is Crystal violet, Iodine, Alcohol/Acetone and the final one is Safranin.

499. Non-parasitic eosinophilia is caused by infection with -

a) Staphylococcus

b) Ehrlichia

c) Coccidioidomycosis

d) Candidiasis

Correct Answer - C

Ans. is 'c' i.e., Coccidioidomycosis [Ref Diagnostic hematology p. 332]

"One of the very few non-parasitic infections that regularly cause eosinophilia is Coccidioidomycosis, a fungal infection. atypical pneumonia

500. Candidias of penis is ?

a) Thrush

b) Leukoplakia

c) Balanitis

d) None

Correct Answer - C

Ans. is 'c' i.e., Balanitis [Ref Essentials of medical microbiology p. 712]

- Candidal infections are identified by their location on the body as follows :
- Axillae, under pendulous breasts, groin, intergluteal folds : intertrigo.
- Glans penis : balanitis
- Follicular pustules : candidal folliculitis
- Nail folds : candidal paronychia
- Mouth and tongue : oral candidiasis (thrush)
- Area included under diaper -diaper dermatitis

501. All culture media are used for antibiotic susceptibility except -

- a) Tetrathionate-F
- b) Blood agar
- c) Chocolate agar
- d) Muller-Hinton agar

Correct Answer - A

Ans. is 'a' i.e., Tetrathionate-F

* The Kirby-Bauer disk diffusion method is one of the most widely practiced **antimicrobial susceptibility tests** (AST).

* It is affected by many factors among which are the **media used**.

* Mueller-Hinton agar (MHA) is the standard **medium** recommended in guidelines.

* **Mueller-Hinton** has a few properties that make it excellent for **antibiotic use**. ...

- Starch is known to absorb toxins released from bacteria, so that they cannot interfere with the **antibiotics**.

- Second, it is a loose **agar**. This allows for better diffusion of the **antibiotics** than most other plates.

502. Cellulitis surrounding diabetic ulcer is mostly caused by ?

a) Streptococcus pyogenes

b) Staphylococcus

c) Mixed organisms

d) Pseudomonas

Correct Answer - C

Ans. is 'c' i.e., Mixed organisms [Ref Essentials of medical microbiology p. 712]

"A mixture of gram-positive cocci and gram-negative acrobes and anaerobes is often implicated in cellulitis surrounding diabetic and decubitus ulcers".

503.

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A patient operated for transurethral resection of prostate [TURP] develops UTI. The organism most commonly grown on culture will be -

a) Proteus

b) E. coli

c) Pseudomonas

d) Listeria

Correct Answer - B

Ans. is 'b' i.e., E. coli [Ref www.jcam.com]

Most common organism causing UTI after transurethral prostatectomy is E coli.

504. Loeffler's serum is an example of

- a) Basal medium
- b) Simple medium
- c) Complex medium
- d) Enrichment medium

Correct Answer - C

Ans. is 'c' i.e., Complex medium [Ref Ananthanarayan 8th/e.p. 140]

Loeffler's *medium* is an enriched medium → A type of special (complex) medium.

505. Most common organism grown in urine culture of pregnant woman with asymptomatic bacteriuria?

a) Proteus

b) E. coli

c) Staph aureus

d) Pseudomonas

Correct Answer - B

Ans. is 'b' i.e., E. coli

- Asymptomatic bacteriuria is the presence of bacteria in a voided urine sample and is caused by bacterial colonization of the urinary tract. It affects about 5 to 10 percent of both sexually active and pregnant women. Asymptomatic bacteriuria is less prevalent in men.
- As the name indicates, asymptomatic bacteriuria does not cause symptoms. The condition simply refers to the detection of bacteria in a urine sample. Nonetheless, there is good reason to be concerned about this infection, particularly if you are pregnant, because it can lead to a symptomatic upper urinary tract infection (namely, pyelonephritis), which can complicate pregnancy.
- Bacteria are typically introduced into the urinary tract during intercourse or when wiping after a bowel movement. The bacterium E. coli is responsible for at least 75 to 80 percent of asymptomatic bacteriuria. Klebsiella pneumoniae, Proteus species, staphylococcal species, enterococci, and group B streptococci can also establish colonization.

506. To create anaerobiosis which organism is used

a) Micrococcus

b) Clostridium

c) B. anthracis

d) Corynebacterium

Correct Answer - A

Ans. is 'a' i.e., Micrococcus

- Obligate aerobic micrococcus is used to create anaerobic condition (anaerobiosis).
- The micrococcus and the anaerobic organism to be cultivated are both inoculated into the same liquid medium.
- During incubation the Micrococcus gradually utilizes the free oxygen creating conditions favorable for the growth of anaerobe.
- After anaerobiosis is achieved, the micrococcus dies (due to lack of oxygen) leaving the anaerobe in pure culture.

507. A 30 years old male is having productive cough with dysnea. Blood gas analysis shows low paO_2 . Chest x-ray is showing reticulonodular pattern. The causative agent is?

a) Staph aureus

b) Pneumococcus

c) P. jirovecii

d) Pseudomonas

Correct Answer - C

Ans. is 'c' i.e., P. jirovecii [Ref Read below]

Reticulo-nodular shadow is seen in interstitial pneumonia.

Among the given options P. jirovecii is a cause of interstitial pneumonia.

Other three options are causes of airspace pneumonia.

"Pneumocystis Carinii pneumonia produces a diffuse, symmetric, fine-to-medium reticulonodular pattern".

508. Which of the following is a method of Pasteurization

a) Vat method

b) Pasteur method

c) Billing method

d) Flash method

Correct Answer - A:D

Ans. is 'a & d' i.e., Vat method & Flash method [Ref Park 23rd/e p. 655]

- Pasteurization is done to destroy the pathogens in milk. It kills nearly 90% of bacteria in milk, including more heat resistant tubercular bacilli and Q-fever organism. However, thermoduric bacteria and spores are not killed.

There are following methods of pasteurization :?

A) Holder method (Vat method)

- Milk is kept at 63-66° C for 30 minutes and then rapidly cooled to 5°C.

B) High temperature short time (HTST) method

- It is also called Flash method. Milk is heated to 72°C for 15 seconds and then rapidly cooled to 4°C.
- It is now the most widely used method.

C) Ultra-high temperature (UHT) method

- Milk is rapidly heated in two stages to 125° C for few seconds, 2nd stage being under pressure. It is then rapidly cooled.

Method	Remarks
Holder/Vat Method	For small and rural communities
HTST (flash)	Most widely used for large

HTST (flash) Method	most widely used, for large quantities
UHT Method	Heating in 2 stages 2'd stage under pressure

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509. Temperature used in Tyndallization

a) 40°C

b) 60°C

c) 80°C

d) 100°C

Correct Answer - D

Ans. is 'd' i.e., 100°C [Ref Ananthanarayan 9th ed p. 31 & 10th ed p. 33]

Tyndallization (intermittent sterilization)

- Media containing sugar or gelatin are sterilized by heating at 100°C for 20 minutes on three successive days.
- First exposure kills all vegetative bacteria.
- Spores germinate and are killed on subsequent exposures

510. Nutrient agar heated at 80°C used for

- a) Spore germination
- b) To grow mesophilic bacteria
- c) To grow thermophilic bacteria
- d) For clostridium isolation

Correct Answer - A:D

Ans. is 'a' > 'd' i.e., Spore germination > For clostridium isolation

- Heating for 20 minutes at 80 degrees centigrade destroys vegetative cells and activates the spores for germination.
- This method can be used to cultivate anaerobic spore-forming organisms (e.g. clostridium)
- About options a & c
- Microorganisms can be grouped into broad (but not very precise) categories, according to their temperature ranges for growth.
- Psychrophiles (cold-loving) can grow at 0°C, and some even as low as -10°C; their upper limit is often about 25°C.
- Mesophiles grow in the moderate temperature range, from about 20°C (or lower) to 45°C.
- Thermophiles are heat-loving, with an optimum growth temperature of 50° or more, a maximum of up to 70°C or more, and a minimum of about 20°C.
- Hyperthermophiles have an optimum above 75°C and thus can grow at the highest temperatures tolerated by any organism. An extreme example is the genus *Pyrodictium*, found on geothermally heated areas of the sea bed. It has a temperature minimum of 82°, an optimum of 105° and a growth maximum of 110°C.

511. Involutional form are seen in which phase of bacterial growth

- a) Lag phase
- b) Log phase
- c) Stationary phase
- d) Death phase

Correct Answer - D

Ans. is 'd' i.e., Death phase [Ref Ananthanarayan 9th ed p. 22]

- Bacterial growth is the division of one bacterium into two daughter cells in a process called *binary fission*. Providing no mutational event occurs, the resulting daughter cells are genetically identical to the original cell.
- Hence "Local doubling" of the bacterial population occurs. Bacteria have a distinct pattern of growth when a bacterium is seeded into a suitable liquid medium and incubated, its growth follows a definite course.

512. A patient is presenting with recurrent staphylococcal infection, kyphoscoliosis and typical faces. The patient is suffering from ?

- a) Ig A deficiency
- b) Hyper IgE syndrome
- c) Common variable immunodeficiency
- d) Burton's Agammaglobulinemia

Correct Answer - B

Ans. is 'b' i.e., Hyper IgE syndrome Job's syndrome (Hyper-IgE syndrome)

Job's syndrome, also called Hyper-IgE syndrome or Hyperimmunoglobulin E syndrome, is an autosomal dominant disorder due to mutations in Signal Transducer and Activator of Transcription-3 (STAT-3).

There is defect in phagocytosis. IgE levels are elevated. Other immunoglobulins are normal.

Clinical manifestations include staphylococcal cold abscess, otitis media, recurrent sinopulmonary and skin infections, and cavitary pneumonia with pneumatoceles.

Beside infections, other findings are characteristic facies with broad nose, osteoporosis, kyphoscoliosis, cerebral.

513. Partial acid fast organism is

a) M. tuberculosis

b) M. Bovis

c) Nocardia

d) None

Correct Answer - C

Ans. is 'c' i.e., Nocardia [Ref Concise Review of microbiology p. 13]

- Partial acid fast means, organism which shows less affinity for primary stain, thus less concentrated H_2SO_4 (instead of 20% H_2SO_4) is used for decolorization of primary stain (Carbol fuchsin).
- Partial acid fast bacteria are M leprae (5% H_2SO_4), and Nocardia (0.5% H_2SO_4)

514. Resolving power of electron microscope

a) 1-5 mm

b) 1-5 μm

c) 1-5 nm

d) 1-5 $\text{\AA}$

Correct Answer - D

Ans. is 'd' i.e., 1-5 $\text{\AA}$ [Ref Essentials of medical microbiology]

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515. Most effective antibody for precipitation ?

a) IgM

b) IgG

c) IgA

d) IgD

Correct Answer - B

Ans. is 'b' i.e., IgG [Ref Harrison 19th/e p. 372 & 18th/e p. 2674;
Ananthanarayan 9th/e p. 98 & 8th/e p. 98]

IgM is more effective than IgG for:

- 1. Immune hemolysis
- 2. Opsonization
- 3. Complement fixation by classical pathway
- 4. Bacterial agglutination

IgG is more effective than IgM for:

- 1. Neutralization of toxins & viruses
- 2. Precipitation reactions.

516. Specificity of antibody is dependent on ?

a) Fc portion

b) Fab region

c) Carboxy terminal

d) All of the above

Correct Answer - B

Ans. is 'b' i.e., Fab region [Ref: Harrison 19th/e p. 372;
Ananthanarayan 9th/e p. 100]

- The infinite range of the antibody specificity of immunoglobulins depends on the variability of the aminoacid sequences at the variable units of H and L chains.
- Variable region is present on Fab region.

517. Classification of staphylococcus is based on -

a) Catalase test

b) Coagulase test

c) Mannitol fermentation

d) Optochin sensitivity

Correct Answer - B

Ans. is 'b' i.e., Coagulase test

Medically important staphylococci that cause human disease are divided into two groups:?

- Coagulase positive: *Staphylococcus aureus*.
- Coagulase-negative: *Staphylococcus epidermidis*, *Staphylococcus haemolyticus*, *Staphylococcus saprophyticus*.

518. Antibody specificity is due to ?

- a) Amino acid sequence at H chain
- b) Amino acid sequence at L chain
- c) Amino acid at carboxy terminal
- d) Amino acid sequence at the amino terminal

Correct Answer - A:B:D

Ans. is 'd > a & b' i.e., Amino acid sequence at amino terminal > Amino acid sequence at H chain & Amino acid sequence at L chain [Ref Read below]

Antibody specificity is due to variability of the aminoacid sequences at the variable unit (at aminoterminal) of both H and L chains (not only H or L chains).

519. Iron helps in virulence of which organism

a) Streptococcus pyogenes

b) Pneumococcus

c) Staphylococcus aureus

d) Pseudomonas

Correct Answer - C

Ans. is 'c' i.e., Staphylococcus aureus

- Staphylococcus aureus causes a significant amount of human morbidity and mortality.
- The ability of S.aureus to cause disease is dependent upon its acquisition of iron from the host.
- S. aureus can obtain iron from various sources during infection, including haem and transferrin.
- The most abundant iron source in humans is haem iron bound by haemoglobin contained within erythrocytes.
- S. aureus is known to lyse erythrocytes through secretion of pore-forming toxins, providing access to host haemoglobin.
- Proteins of the iron-regulated surface determinant (Isd) system bind host hemoproteins, remove the haem cofactor, and shuttle haem into the cytoplasm for use as a nutrient iron source.
- Deletion of Isd system components decreases staphylococcal virulence, underscoring the importance of haem iron acquisition during infection.
- In addition to haem, S. aureus can utilize transferrin iron through the secretion of siderophores.
- Several staphylococcal siderophores have been described, some of which have defined roles during the pathogenesis of staphylococcal

infections.

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520. Wool-Sorter disease is caused by

- a) Pseudomonas
- b) Bacillus anthracis
- c) Vibrio parahemolyticus
- d) Spirillum minor

Correct Answer - B

Ans. is 'b' i.e., Bacillus anthracis [Ref Harrison 19th e p. 261; Ananthnarayan 10th e p. 246]

Bacillus Anthracis is the causative organism of anthrax.

In human, anthrax occurs in following forms ?

- Cutaneous anthrax (Hide porter's disease)
- It is the *most common form of anthrax*. It is a painless lesion and is called charbon or malignant pustule. It generally resolves spontaneously, but 10-20% of untreated patients may develop fatal septicemia.
- Pulmonary anthrax (Wool sorter's disease)
- It follows inhalation of dust from infected wool. It presents as hemorrhagic pneumonia.
- Intestinal anthrax is rarest form.

521. Not true about sporothrix Schenckii ?

- a) Dimorphic fungus
- b) Asteroid bodies
- c) Copper penny bodies
- d) Common in gardeners

Correct Answer - C

Ans. is 'c' i.e., Copper penny bodies [Ref Harrison 19th/e p. 1353]

Copper penny bodies are seen in chromoblastomycosis.

Sporothrix Schenckii

- Sporothrix Schenckii is a dimorphic fungus.
- The organism (sporothrix schenckii) are usually described as tiny, cigar-shaped bodies, 3-5 microns in length, which bear from one to three small oval buds at either or both poles.
- Occasionally a larger asteroid body may be seen.
- Because S. schenckii naturally found in soil, hay, sphagnum moss, and plants, it usually affects farmers, gardeners, and agricultural workers.
- This fungal disease usually affects the skin although rare forms can affect the lungs, joints, bones and CNS.
- Fungus enters through small cuts and abrasions in the skin to cause the infection.
- Because roses can spread the disease, it is one of a few diseases referred to as rose-thorn or rose gardener's disease.

522. Fishy odour is found on growth of which organism

- a) Proteus
- b) Pseudomonas
- c) Yersinia pseudotuberculosis
- d) Yersinia pestis

Correct Answer - A

Ans. is 'a' i.e., Proteus

Proteus is part of the normal flora of the human gastrointestinal tract. It can also be found free-living in water and soil. When this organism, however, enters the urinary tract, wounds, or the lungs it can become pathogenic

Culture of proteus bacilli has a characteristic putrefactive odor described as '*fishy or seminal*'.

Rotten cooked fishy odor: *Proteus mirabilis* produces a very distinct fishy odor. On **Salmonella-Shigella (SS) agar**, *Proteus* usually smells like "rotten cooked fish".

523. Lipophilic fungus is ?

a) Malassezia furfur

b) Candida

c) Cryptococcus

d) Histoplasma

Correct Answer - A

Ans. is 'a' i.e., Malassezia furfur [Ref Principles of medical microbiology p. 781]

- Malassezia furfur (Pityrosporum ovale) is a lipophilic fungus that is found in areas of the body that are rich in sebaceous glands.
- This fungus causes tinea versicolor (pityriasis versicolor).

524. A 60 years old farmer has developed swelling on the sole of foot with discharging yellow granules. The diagnosis is -

a) Fungal mycetoma

b) Eumycetoma

c) Actinomycosis

d) Candidiasis

Correct Answer - C

Ans. is 'c' i.e., Actinomycosis Mycetoma

- Is a localized chronic granulomatous involvement of the subcutaneous and deeper tissues, commonly affecting the foot and less often the hand and other parts.
- Presenting as a subcutaneous swelling with multiple discharging sinuses.
- Sinuses discharge seropurulent fluid containing granules.
- These granules are microcolonies of the etiological agents.
- Mycetoma can be caused by both fungus and bacteria

525. Rapid detection of meningococcal meningitis is

a) Blood culture

b) CSF culture

c) PCR

d) None

Correct Answer - C

Ans. is 'c' i.e., PCR [Ref Basic in microbiology p. 719]

"PCR assay can be performed rapidly with a turnaround time of 2 hour from initiation of DNA extraction to the issuing of reports". Laboratory diagnosis of meningococci

Specimens used are CSF (for cases), nasopharyngeal swab (for carrier), blood (in meningococemia & early meningitis), and petechial lesions (in meningococemia).

- Best specimen for case 4 CSF (by lumbar puncture).
- Best specimen for carrier 4 Naspharyngeal swab.

526. Presumptive diagnosis of meningococcal meningitis is made earliest by -

a) CSF culture

b) PCR

c) Latex agglutination

d) CFT

Correct Answer - C

Ans. is 'c' i.e., Latex agglutination [Ref Essentials of medical microbiology 3^d ed p. 412]

- In combination with a clinical picture CSF examination consistent with bacterial meningitis, a presumptive diagnosis of bacterial meningitis caused by *N. meningitidis*, *S. pneumoniae*, or *H. influenzae* can be made after performing a Gram stain of the CSF sediment or by detection of specific antigens in the CSF by a latex agglutination test or using RDTs.
- Positive results for any of these tests can rapidly provide evidence of infection even if cultures fail to grow. PCR and CSF culture are used for definitive diagnosis (not presumptive diagnosis)

527. Chlamydospore is formed by ?

a) Candida albicans

b) Candida pscitasi

c) Histoplasma

d) Cryptococcus

Correct Answer - A

Ans. is 'a' i.e., Candida albicans [Ref Ananthanarayan 8thle p. 607-608]

- All candida species pathogenic for humans are also encountered as commensals of humans, particularly in the mouth, stool and vagina.
- They grow rapidly on simple media as oval budding cells at 25° to 37°C.
- In tissue, both yeasts and pseudohyphae are present.
- Candida albicans is differentiated by other candida :
- It forms true hyphae (mycelia) or germ tubes when grown in serum.
- It forms thick walled large spores called chlamydospores when grown in corn meal agar.
- It is dimorphic.

528. Sewer swabs are taken to detect

- a) Typhoid cases in community
- b) Cholera cases in community
- c) Typhoid carriers in community
- d) Cholera carriers in community

Correct Answer - C

Ans. is 'c' i.e., Typhoid carriers in community [Ref Textbook of practical Microbiology p. 721]

- Typhoid carriers are detected by Sewer-swab method'.
- The use of sewer swabs enables premises to be screened for the possibility of the existence of a salmonella problem more quickly and more easily than by the examination of many end-of-line samples.
- In the event of salmonellae being found, a return visit can be paid and detailed samples taken to attempt to defect the source of contamination.

529. *Aspergillus fumigatus* is differentiated by other fungi by ?

- a) Showing septate hyphae
- b) Grow at 45°C
- c) Cause respiratory tract infection
- d) Most common endemic mycosis

Correct Answer - B

Ans. is 'b' i.e., Grow at 45°C [Ref Harrison 19thie p. 1346; Ananthanarayan 8th/e p. 613]

Aspergillus is a mould with septate branching hyphae.

Ability of *A. fumigatus* to grow at 45° C helps to distinguish it from other species.

Mode of transmission - Inhalation of *Aspergillus* spores (Conidia) into lungs.

The commonest human disease caused by *aspergillus* is otomycosis.

Aspergillus infection in neutropenic patient is characterized by hyphal invasion of blood vessels, thrombosis, necrosis and hemorrhagic infarction

530. Species of shigella causing arthritis

a) Sh dysenteriae-1

b) Sh sonnei

c) Sh flexneri

d) Sh boydii

Correct Answer - C

Ans. is 'c' i.e., Sh flexneri [Ref Harrison 18th/e p. 945]

- Shigella is highly communicable. The infective dose for shigella is less. It can be as low as 10-100 bacilli because they survive gastric acidity better than other enterobacteriae.
- Shigellae produce following clinical features.
 - 1) Intestinal : These are :-
 - Dysentery : Most common cause is Sh dysenteriae type I.
 - Diarrhea : Usually by Sh Sonnei.
 - 2) Extraintestinal : These are hemolytic uremic syndrome (caused by Sh dysenteriae-I), arthritis (Sh flexneri), seizures (Sh flexneri), pneumonia and Reiter syndrome (in HLA B27 association).

531. Ectothrix is caused by ?

a) T tonsurans

b) T violaceum

c) Microsporum canis

d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Microsporum canis [Ref: Greenwood 16thie p. 574]

- Tinea capitis is dermatophytic infection of scalp and scalp hair. Occurs commonly in children. It is uncommon in adults (in contrast, T.crisis, T.manuum and T.unguim are common in adults). Caused by genera trichophyton or microsporum. As epidermophyton does not affect the hair, Epidermophyton does not cause T.capitis. Two most common species causing T-Capitis are M.canis & T. tonsurans. Tinea capitis may be two types.
 - 1. Endothrix Invasion of hair shaft by fungus. It is caused by T.tonsurans (MC), T.violaceum, T.schoenleinii.
 - 2. Ectothrix Fungal invasion is restricted to the outer most cuticle of hair. It is caused by M.canis (MC), M.audouini, T.mentagrophytes. As ectothrix is the commonest type of T.capitis, Microsporum canis is the most common cause of T.Capitis

532. Griffith classification is based on

- a) 'C'-carbohydrate
- b) M, T, R antigens
- c) Type of hemolysis
- d) O, requirement

Correct Answer - B

Ans. is 'b' i.e., M, T, R antigens [Ref Ananthanarayan 9th/e p. 209, 210]

Group 'A' strep. are further subdivided into types based on the protein (M, T and R) antigens present on the cell surface (Griffith typing). About 80 types of str. pyogenes have been recognized.

533. Sabouraud's dextrose [glucose] agar is used for isolation of -

a) Pseudomonas

b) B. Antracis

c) Fungi

d) Ancylostome

Correct Answer - C

Ans. is 'c' i.e., Fungi [Ref Greenwood 10/e p. 570; Ananthanarayan 8th/e p. 601]

Culture media used in mycology are :

- 1. Sabouraud's glucose agar (most common)
- 2. Czapek - Dox medium
- 3. Corn meal agar

534. Similarity between chlamydia and virus is

- a) Filterable through filter
- b) Ability to grow in cell free media
- c) Contains both DNA and RNA
- d) All of the above

Correct Answer - A

Ans. is 'a' i.e., Filterable through filter [Ref Textbook of microbiology by Parija p. 418]

Chlamydiae were thought to be viruses because (like viruses) they :

- Pass through 0.45 μ m filters.
- Are obligate intracellular parasite - cannot be grown in cell free media.

535. Bloody diarrhea in HIV infected patient is mostly due to ?

a) Cryptosporidium

b) Isospora

c) CMV

d) Salmonella

Correct Answer - C

Ans. is 'c' i.e., CMV [Ref www.medscape.com]

- The most common of the opportunistic infections that cause diarrhea in patients with AIDS are CMV infection, cryptosporidiosis, microsporidiosis, and MAC infection. CMV infection is the most common opportunistic viral infection in the GI tract of HIV-infected patients and can cause problems from the mouth to the anus. It most frequently causes a colitis associated with fever, crampy abdominal pain, and frequent (often bloody) stools.

536. Which test cannot differentiate endemic and epidemic typhus

- a) Weil-Felix reaction
- b) Complement fixation test
- c) Immunofluorescence
- d) Radio precipitation

Correct Answer - A

Ans. is 'a' i.e., Weil-Felix reaction

Both epidemic typhus and endemic typhus are positive for OX-19 antigen → Thus Weil Felix reaction cannot differentiate between the two.

Weil-Felix reaction

- This reaction is an agglutination test in which sera are tested for agglutinins to O antigens of certain nonmotile proteus strains OX- 19, OX - 2 and OX - K.
- The basis of the test is the sharing of an alkali - stable carbohydrate antigen by some rickettsiae and by certain strains of proteus, P. vulgaris OX - 19 and OX - 2 and P. mirabilis OX - K.
- The test is usually done as a tube agglutination, though rapid slide agglutination methods have been employed for screening.

537. CCR5 mutation is related to which condition ?

- a) Resistance to HIV infection
- b) Susceptibility to HIV infection
- c) Resistance to HBV infection
- d) Susceptibility to HBV infection

Correct Answer - A

Ans. is 'a' i.e., Resistance to HIV infection [Ref www.lumenlearning.com]

- In recent years, scientific interest has been piqued by the discovery of a few individuals from northern Europe who are resistant to HIV infection in 1998, American geneticist Stephen J. O'Brien at the National Institutes of Health (NIH) and colleagues published the result of their genetic analysis of more than 4,000 individuals.
- These indicated that many individuals of Eurasian descent (up to 14% in some ethnic groups) have a deletion mutation, called CCR5 delta 32, in the gene encoding CCR5 is a coreceptor found on the surface of T cells that is necessary for many strains of the virus to enter the host cell.
- The mutation leads to the production of a receptor to which HIV cannot effectively bind and thus blocks viral people homozygous for this mutation have greatly reduced susceptibility to HIV infection, and those who are heterozygous have some protection from infection as well.

538. E. coli subtypes are divided on the basis of

a) Lactose fermentation

b) Virulence properties

c) Somatic O antigen

d) Maltose fermentation

Correct Answer - B

Ans. is 'b' i.e., Virulence properties [Ref en wikipedia.org]

Enteric E.coli (EC) are classified on the basis of serological characteristics and virulence properties :?

- Enteropathogenic E. coli (Enteroadherent E coli)
- Enterohemorrhagic E.coli or verotoxigenic E.coli
- Enterotoxigenic E. coli
- Enteroggregative E. coli
- Enteroinvasive E. coli

539. True about rhabdoviridae are all except ?

- a) Includes vesiculostomatitis virus
- b) Rabies virus is inactivated by formalin
- c) Rabies virus is negative sense double stranded RNA virus
- d) All of the above correct

Correct Answer - C

Ans. is 'c' i.e., Rabies virus is negative sense double stranded RNA virus

Rhabdoviridae contains two genera :?

- 1. Vesiculoviruses : Vesiculostomatitis virus, chandipura virus.
- 2. Lyssavirus : Rabies virus.

Rabies virus

- It is an enveloped, RNA (negative sense ss RNA) virus.
- It has RNA dependent RNA polymerase.
- It is a bullet shaped virus.
- Rabies virus is sensitive to ethanol, iodine preparations, soap, quaternary ammonium compound, detergents and lipid solvents (like ether, chloroform). It is inactivated by phenol, beta-propiolactone (BPL), formalin, Sun light, UV irradiation, and by heat.
- Rabies is primarily a zoonotic disease of warm-blooded animals, particularly carnivorous such as dogs, Cats, Jackals and wolves.
- It is transmitted to man usually by bites or licks of rabid animals.
- It is the communicable disease which is always fatal.
- It is dead end infection in man.

540. ELISA test for virulence antigen is used for which type of E coli

a) ETEC

b) EIEC

c) EHEC

d) EAEC

Correct Answer - B

Ans. is 'b' i.e., EIEC [Ref Ananthnarayan 9th/e p. 279]

- For laboratory diagnosis of EIEC, the Sereny test used to be employed (that is, instillation of suspension of freshly isolated EIEC or shigella into the eyes of guinea pigs leads to mucopurulent conjunctivitis and severe keratitis).
- Mice may be used instead of guinea pigs. Cell penetration of HeLa or HEP-2 cells in culture is a more humane diagnostic test.
- This ability to penetrate cells is determined by a large plasmid, detection of which can also be a diagnostic test. The plasmid codes for outer membrane antigens called the 'virulence marker antigens' (VMA) which can be detected by the ELISA (VMA ELISA) test.

541. E. coli infection occur in which enzyme defect

a) Lactase

b) Pyruvate kinase

c) Pepsin

d) Trypsin

Correct Answer - B

Ans. is 'b' i.e., Pyruvate kinase [Ref Hardcore microbiology & immunology by Benjamin W Sears p. 133]

Opportunistic infections is immunodeficiency due to defect in myeloid cells are :-

- Staph aureus
- Klebsiella
- Pneumococcus
- E. coli
- Neisseria
- Candida

Conditions causing defect in myeloid cells are :?

- Chronic granulomatous disease
- Chediak-Higashi syndrome
- G6PD and pyruvate kinase deficiency
- Myeloperoxidase deficiency

542. Culture media containing potassium tellurite

a) TCBS medium

b) Monsur medium

c) BYCE medium

d) Muller Hinton agar

Correct Answer - B

Ans. is 'b' i.e., Monsur medium [Ref Fundamental principles of bacteriology p. 129]

Monsur's GTTA medium is Monsur's gelatin tourocholate trypticase tellurite agar. Selective media for vibrio cholerae

- TCBS medium (pH 8.6) : This medium contains thiosulfate, citrate, bile salts, sucrose, and bromothymol blue (indicator). *V. cholerae* produces large, yellow convex colonies on this medium.
- This is due to fermentation of sucrose by the bacteria, leading to production of acid. Accumulation of acid reduces pH of the medium, and so the color of the bromothymol blue indicator becomes yellow, thus making *V. cholerae* colonies yellow. Non sucrose-fermenting *V. parahaemolyticus* produces blue green colonies.
- Monsur's GTTA medium (pH 8.5): High pH of the medium and presence of potassium tellurite in this medium inhibits most of Gram positive bacteria and enteric bacteria with exception of proteus species.
- Hence, the GTTA medium is used for isolation of *V. cholerae* and other vibrios from feces. *V. cholerae* produces small translucent colonies with grayish black center and a turbid halo after 24 hours of incubation. The colonies become larger (3-4 mm in size) after a prolonged incubation of 48 hours.

- Alkaline BSA (pH 8.2) : This is another selective medium used for *V. cholerae*. The colonies on BSA are similar to those on nutrient agar.

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543. Borrelia causes which of the following

a) Weil's disease

b) Bejels

c) Vincent angina

d) Yaws

Correct Answer - C

Ans. is 'c' i.e., Vincent angina

Three important diseases caused by Borreliae are :?

- Lyme disease : Caused by B. burgdorferi
- Relapsing fever : Caused by B. recurrentis, B. duttoni, B. hermsii, B. Parkeri, B. turicatae, B. persica, B. hispanica.
- Vincent's angina : Caused by B. vincenti.

544. Zika virus causes ?

a) Hepatitis

b) Myocarditis

c) Conjunctivitis

d) None of these

Correct Answer - C

Ans. is 'c' i.e., Conjunctivitis

Zika virus (ZIKV) is a flavivirus related to yellow fever virus. It is transmitted by Aedes mosquito.

Zika virus disease (Zika) is a disease caused by the Zika virus, which is spread to people primarily through the bite of an infected

545. What is similar between rotavirus and Norwalk virus ?

- a) Both belong to same family
- b) Both have segmented genome
- c) Both have single stranded RNA
- d) Both are causes of viral gastroenteritis

Correct Answer - D

Ans. is 'd' i.e., Both are causes of viral gastroenteritis [Ref *Essentials of Microbiology* p. 497]

Rota virus belongs to reoviridae → double stranded segmented RNA.

Norwalk virus belongs to calciviridae → Single stranded non segmented RNA.

Both Rota virus and Norwalk virus are causes of viral gastroenteritis

546. Rota-teq oral vaccine for rotavirus contains ?

a) 2 reassorted rotaviruses

b) 3 reassorted rotaviruses

c) 4 reassorted rotaviruses

d) 5 reassorted rotaviruses

Correct Answer - D

Ans. is 'd' i.e., 5 reassorted rotaviruses [Ref Essential of medical microbiology p. 932] Rota-virus vaccine

- The Rotavirus vaccines are live -attenuated vaccines given orally.
- **Two new vaccines are now in use -**
 - 1. RV5 oral pentavalent vaccine (Rota teq) contains five reassortant rotaviruses developed from 5 human strains on bovine rotavirus background [These five strains are G1, G2, G3, G4 and P (8)]
 - 2. RV1 monovalent vaccine (Rotarix) contains one live attenuated rotavirus strain [the strain is P1 A (8) G1]
- The administration of Rotarix (2 doses) and Rota Teq (3 doses) needs to be completed by 32 weeks of age to minimize any potential risk of intussusception.
- The first licensed rotavirus vaccine, a Rhesus monkey rotavirus - based tetravalent human reassortant vaccine (Rotashield), was withdrawn after this live oral vaccine was associated with development of intestinal intussusception.

547. Core antigen [HBO in HBV is enclosed by which gene ?

a) S

b) C

c) P

d) X

Correct Answer - B

Ans. is 'b' i.e., C [Ref Ananthanarayan 9th/e p. 544]

- The genome of HBV is made of circular DNA, but it is unusual because the DNA is not fully double stranded -> one of the strands is incomplete and other is complete & partially double stranded DNA.
- There are four known genes encoded by genome - 'C', 'X', 'P', 'S'.
- P gene is the largest gene.. X-gene codes for **HBx Ag**, which can transactivate the transcription of cellular and viral genes and may contribute to carcinogenesis. HBx Ag and its antibody are present in patients with severe chronic hepatitis and **hepatocellular carcinoma**.

548. Which of the following is Hepadnavirus ?

a) HAV❖❖

b) HBV

c) HCV

d) HDV

Correct Answer - B

Ans. is 'b' i.e., HBV❖ [Ref Ananthnarayan 9th/e p. 549 & 8th/e p. 545]

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549. HSV-2 causes latent infection in which nerve plexus/ ganglia ?

a) Trigeminal ganglion

b) Otic ganglion

c) Sacral ganglion

d) Ciliary ganglion

Correct Answer - C

Ans. is 'c' i.e., Sacral ganglion [Ref Essentials of medical microbiology 3rd ed p. 1215]

Site of latency

HSV-1 → Trigeminal ganglion.

HSV-2 → Sacral ganglion.

550. Hand foot mouth disease is caused by ?

a) Enterovirus -70

b) Coxsackie - A virus

c) Coxsackie - B virus

d) Enterovirus

Correct Answer - B

Ans. is 'b' i.e., Coxsackie -A virus [Ref Greenwood 1e/e p. 459; Ananthanarayan 9th/e p. 491]

There are two types of Coxsackie viruses :

1. Coxsackie A (Serotypes 1 to 24) : They cause aseptic meningitis (especially A7 and A9), Herpangina, febrile illness, acute hemorrhagic conjunctivitis (by A24), and 'Hand-foot-mouth disease'.
2. Coxsackie B (Serotypes 1 to 6): They cause aseptic meningitis (all serotypes), neonatal disease, Bornholm disease (pleurodynia or epidemic myalgia), myocarditis, hepatitis, pancreatitis & DM (serotype B4), and pneumonia.

551. All viruses are associated with specific inclusion body, except ?

a) CMV

b) Malluscum contagiosum

c) EBV

d) Yellow fever

Correct Answer - C

Ans. is 'c' i.e., EBV [Ref Essentials of medical microbiology p. 791]

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552. Intermediate host is not required for which parasite -

a) Toxoplasma

b) Schistosoma

c) Ancylostoma

d) Fish tapeworm

Correct Answer - C

Ans. is 'c' i.e., Ancylostoma [Ref Rajesh Karykarte p. 7]

The sequential stages in growth, development and multiplication constitute its life cycle

553. Generation time for M tuberculosis

a) 10-15 min

b) 10-15 hours

c) 10-15 days

d) 5-10 days

Correct Answer - B

Ans. is 'b' i.e., 10-15 hours [Ref Ananthanarayan 8th/e p. 365]

Generation time of lepra bacillus → 4 12-13 days

Generation time of tubercle bacillus → 14 hours

Generation time of coliform bacilli → 20 minutes

554. Maurer's dots are seen in which species of plasmodium?

a) P ovale

b) P vivax

c) P falciparum

d) P malariae

Correct Answer - C

Ans. is 'c' i.e., P. falciparum [Ref Chatterjee 12th/e p. 79-80]

P. vivax → Schuffner's dot

P. malariae → Ziemann's stippling,

P. falciparum → Maurer's dot

P. ovale → Schuffner's dot

555. Which stage of Leishmania is found in spleen aspirate of patient ?

a) Amastigote

b) Promastigote

c) Epimastigote

d) Trypomastigote

Correct Answer - A

Ans. is 'a' i.e., Amastigote [Ref Essentials of parasitology p. 122]

Amastigote forms, also known as Leishmania donovani bodies, are found intracellularly in tissues like liver, spleen and bone marrow. A positive bone marrow or spleen aspiration for L. donovani bodies provides confirmation of diagnosis.

556. Adherence of *E. histolytica* to colonic mucosa is mediated by ?

a) Fibronectin

b) Lectin

c) Collagen

d) Fucose

Correct Answer - B

Ans. is 'b' i.e., Lectin [Ref www.pathologyoutlines.com]

Pathophysiology of *E. histolytica* infection

- Cyst are ingested from fecally contaminated food or water, sexual transmission also occurs.
- Excystation to 8 motile trophozoites occurs in the small intestine
- The cysts are resistant to gastric acid (and chlorine in water supplies).
- Trophozoites are potentially invasive and multiply by binary fission.
- In an estimated 20% of infections invasion into the wall of the colon with tissue destruction occurs.

Adherence to colonic mucosa is mediated by a lectin on *E. histolytica*'s surface.

- The parasite then induces apoptosis of epithelial cells through a channel forming pore protein
- *E. histolytica* ingests remnant cells.
- Some trophozoites undergo encystation through signalling pathways completing the cycle.

557. Pulmonary eosinophilia is found in infection with ?

a) Babesia

b) Malaria

c) Strongyloides

d) Trypanosoma

Correct Answer - C

Ans. is 'c' i.e., Strongyloides [Ref Harrison 18th/e p. 2120 & 17th/e p. 1610]

Ascaris

Strongyloides stercoralis

Ancylostoma (hook worm)

Wuchereria bancrofti or W. malayi

Toxocara

558. Cyst with scolex and hooks is seen in

a) T. saginatu

b) Fish tapeworm

c) Echinococcus

d) H. diminuta

Correct Answer - C

Ans. is 'c' i.e., Echinococcus [Ref: Clinical parasitology 3rd/e p. 315]

First one must understand the meaning of scolex. Scolex is pear-shaped or knoblike head of cystodes (tapeworms).

Scolex is covered with suckers and hooks :-

1. Taenia solium : Scolex contains four suckers and rostellar hooks (rostellum with hooks).
2. Taenia saginata : Scolex contains four suckers but no hooks/rostellum (hookless).
3. H. Nana : Scolex contains four suckers and rostellum of hooks.
4. H. diminuta : Scolex contains four suckers but no hooks (hookless).
5. Echinococcus : Scolex contains suckers and rostellum of hooks.
6. Diphylobothrium lotus : Scolex has two elongated sucking grooves (instead of suckers). There are no hooks (hookless).

559. E. coli is differentiated by E histolytica by presence of

a) Very active movement

b) Thin nuclear membrane

c) Cyst with 1-4 nuclei

d) Blunt pseudopodia

Correct Answer - D

Ans. is 'd' i.e., Blunt pseudopodia [Ref: Essentials of medical parasitology p. 37]

560. Example of transfer of drug resistance by conjugation -

- a) Staphylococci to rifampicin
- b) Pneumococcus to penicillin G
- c) **M** tuberculosis to antitubercular drugs
- d) E coli to streptomycin

Correct Answer - D

Ans. is 'd' i.e., E coli to streptomycin [Ref Basics in laboratory microbiology p. 781]

Drug resistance

It refers to unresponsiveness of a microorganism to an antimicrobial. Drug resistance may be acquired by :

1. Mutation

- It may be single step (enterococci to streptomycin, staphylococci to rifampicin) or multistep (erythromycin, tetracycline, chloramphenicol, salmonella for ciprofloxacin).
- Mutational drug resistance is also important in tuberculosis.

2. Genetic transfer

Drug resistance from one organism to other may be transferred by :

- **Conjugation** (most common): It is responsible for multidrug resistance. It is important for resistance of *S. typhi* against chloramphenicol and *E. coli* against streptomycin.
- **Transduction** : Most important for transfer of resistance in staphylococci by (3 – lactamase).
- **Transformation** (less significant) : Important in pneumococci resistance to penicillin G

561. Shadow casting is used in -

- a) Light microscopy
- b) Electron microscopy
- c) Optical microscopy
- d) Fluorescence microscopy

Correct Answer - B

Ans. is 'b' i.e., Electron microscopy [Ref Cell and molecular biology p.726]

Two standard methods of staining in electron microscopy are :

- .. Shadow casting
- .. Negative staining

562. Frozen phenomenon is used for -

- a) Sterilization of heat sensitive material
- b) Killing thermophilic bacteria
- c) Preservation of microorganisms
- d) Stimulating metabolism of microorganism

Correct Answer - C

Ans. is 'c' i.e., Preservation of microorganisms

[Ref Microbiology Application Based Approach p. 189]

- Some psychrophilic bacteria can grow at 0°C, but subzero temperatures will inhibit the metabolism of microorganism in general.
- Freezing is commonly used to preserve foods, drugs and laboratory specimens because it effectively stops microbial growth.
- However, subzero temperature may not kill microorganism (especially psychrophilic) and may in fact preserve them along with the material being frozen.
- This phenomenon has been used by microbiologists to store and preserve microorganisms.

563. True about universal precautions are all except -

- a) To prevent transmission of blood borne pathogens
- b) Includes use of hand washing
- c) Consider that all body fluids are contaminated with blood
- d) Includes use of gloves and masks

Correct Answer - B

Ans. is 'b' i.e., Includes use of hand washing [Ref **Microbiology for surgical techniques** p. 796]

Hand washing is a part of standard precautions not universal precautions

Universal precautions

- Universal precautions is an approach to infection control to treat all human blood and certain human body fluids as if they were known to be infectious with HIV, HBV and other blood borne pathogens.
- Blood borne pathogen standard requires.
- Employees to observe 'universal precautions' to prevent contact with blood or other potentially infectious material (OPIM)
- Treat all blood and OPIM with proper precautions like use of gloves, masks and gown.

Other potentially infectious material includes :

1. Body fluids: CSF, semen, vaginal secretion, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid contaminated with blood.
 2. Any unfixed tissue or organ (other than skin) from human.
 3. HIV - containing cells, fluids or cultures.
- Universal precautions have been updated into standard precautions that state all body fluid (except sweat) should be considered

infectious.

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564. Nucleic acid is not found in -

a) Virus

b) bacteria

c) Fungus

d) Prions

Correct Answer - D

Ans. is 'd' i.e., Prions [Ref Harrison 19th /e p. 451 & 17th/e p.2647]

- Prions are infectious particle which contains protein **only**.
- They do not have nucleic acid.

565. Oil paint appearance on nutrient agar is seen in -

a) Streptococcus pyogenes

b) Staphylococcus aureus

c) Bordetella pertussis

d) H. influenzae

Correct Answer - B

Ans. is 'b' i.e., Staphylococcus aureus

- Staphylococcus is facultative anaerobe. Optimum pH for growth is 7.4 - 7.6 and optimum temperature is 37°C.
- Staph aureus produces golden yellow pigment, which is maximum at 22°C.
- Most of the staphylococcus species grow in the presence of 10% NaCl

566. Streptococcal pneumoniae pneumonia present at -

a) < 5 years

b) 5 - 15 years

c) 20 - 25 years

d) 30 - 40 years

Correct Answer - A

Ans. is 'a' i.e., < 5 years [Ref: Textbook of Microbiology by Parija p.197]

- Streptococcus pneumoniae is the leading cause of pneumonia, both lobar and bronchopneumonia.
- Pneumonia is common at the extreme of ages :
- Children (especially < 5 years of age)
- Elderly (> 60-65 years)
- Serotypes 6, 14, 18, 19 and 23 are responsible for most cases of pneumonia in children, while serotypes 1, 3, 4, 7, 8 and 12 cause pneumonia in adults.

567. Most common age group affected by streptococcus pyogenes -

a) < 5 years

b) 5 - 15 years

c) 20 - 25 years

d) 30 - 40 years

Correct Answer - B

Ans. is 'b' i.e., 5 - 15 years [Ref Parija p. 191]

- Sore throat (tonsillitis) is the most common manifestation of streptococcal infection and affects 5-15 years age group.

568. Oropharyngeal commensal which predisposes to candidiasis -

a) Hemophilus influenzae

b) Streptococcus

c) Staphylococcus

d) Lactobacillus

Correct Answer - B

Ans. is 'b' i.e., Streptococcus [Ref Textbook of polymicrobial disease - Chapter 18]

- An example of the complexity of coaggregation may be the range of intergeneric coaggregations occurring between the oral fungal pathogen candida albicans and other oral species that may play an important role in the colonization of the oral cavity by candida albicans.
- Although streptococcal species, namely, streptococcus gordonii, streptococcus oralis and streptococcus sanguis, exhibit the highest affinities for C albicans, C albicans (as well as Candida dubliniensis) have been shown to coaggregate with Fusobacterium species in suspension.
- Actinomyces has also been shown to coaggregate with candida albicans.

569. Hemophilus parainfluenzae requires -

a) Factor V

b) Factor X

c) Factor V & X

d) Factor VII

Correct Answer - A

Ans. is 'a' i.e., Factor V [Ref: Ananthanaran 9th /e p. 327 & 8th /e p. 330]

- H. influenzae, H. aegyptius, H. haemolyticus → Factor X & V.
- H. Parainfluenzae, H. Parahemolyticus, H. Paraphrophilus → Factor V.
- H. ducreyi, H. aphrophilus → Factor X.

570. Most sensitive test in syphilis -

a) VDRL

b) TP-PA

c) RPR

d) FTA-ABS

Correct Answer - B

Ans. is 'b' i.e., TP-PA [Ref Harrison M^ole p. 1137, 1138 e.7 18th/e p. 1385, Ananthanarayan 9th/e p. 374, 375 & p. 374-78]

- TPPA is the most sensitive serological test overall (considering all stages of syphilis).
- All the serological tests have 100% sensitivity in secondary stage of syphilis

Test	Primary	Secondary	Latent	Tertiary
VDRL / RPR	78 (74-87)	100	95 (88-100)	71 (37-94)
FTA - ABS	84 (70-100)	100	100	96
TP - PA	89	100	100	NA

571. Fresh water swimming leads to infection by -

- a) Bordetella pertussis
- b) Corynebacterium diphtheriae
- c) M tuberculosis
- d) Pseudomonas

Correct Answer - D

Ans. is 'd' i.e., Pseudomonas [Ref Alcamo's fundamentals of microbiology p. 669]

"Extended swimming in fresh water pools can irritate and break down skin in the ear canal allowing bacteria such as pseudomonas, staphylococcus or streptococcus to penetrate and cause otitis externa"

- Pseudomonas is the most common cause of swimmer's ear infection.
- Pseudomonas also causes "hot tub rash" syndrome or hot-tub folliculitis, associated with use of hot tub, less commonly associated with whirlpools or swimming pools.

572. Most common complication of diphtheria is -

a) Myocarditis

b) Pneumonia

c) Meningitis

d) Endocarditis

Correct Answer - A

Ans. is 'a' i.e., Myocarditis [Ref With text]

"Myocarditis is the most common complication of diphtheria and the leading cause of death in diphtheric cases, whose incidence is 10-25%"

Essentials in Microbiology "Complications of diphtheria include myocarditis (the most common complication), thrombocytopenia, vocal cord paralysis and neuritis" → Clinical microbiology.

"Most common complications of diphtheria are myocarditis and toxic neuritis" → NMS

Two most common complications of diphtheria are :

1. Myocarditis

2. Toxin neuritis → Paralysis of soft palate is the most common manifestation of neuritis.

573. All are true about anaerobic infection except -

- a) Most infections are endogenous
- b) Exudates and swabs are best for culture
- c) Specimen for UTI is suprapubic aspiration
- d) They are found normally on skin and GIT

Correct Answer - B

Ans. is 'b' i.e., Exudates and swabs are best for culture [Ref Essentials of microbiology p.224]

- Most anaerobic bacteria that cause infection are members of our normal indigenous flora and anaerobic infections are usually endogenous, caused by tissue invasion by bacteria normally resident on respective body surfaces.
- Anaerobic bacteria are normally present on skin, mouth, nasopharynx, upper respiratory tract, gut and vagina.
- Ideal specimens for anaerobic cultures are samples of needle aspirates and proper tissue specimens. Anaerobic swabs are usually discouraged.

Important specimens are :-

1. Local abscess : Needle aspirates.
2. Pulmonary : Transtracheal aspirates, lung aspirates, pleural fluid, protected bronchial wash.
3. Abdominal : Abdominal abscess aspirate.
4. Urinary tract : Suprapubic bladder aspirate.
5. Genital tract : Culdocentesis specimen, endometrial swabs.
6. CNS : CSF, Aspirate of abscess

574. Most common route of infection in pasteurella cellulitis -

a) Animal bites or scratches

b) Aerosols or dust

c) Contaminated tissue

d) Human to human

Correct Answer - A

Ans. is 'a' i.e., Animal bites or scratches [Ref Ananthanarayan 9th 1e p. 325; 7^h/e p. 326; Harrison 19th 1e p. 830 & 1e/e p. 1235]

Transmission to humans may occur by two routes?

1) **Direct inoculation through skin**

- The most common mode of transmission of *P. microcida* is direct inoculation by a bite or scratch. Most of the infections are caused by cats.
- Infection may also occur via deposition of organism on injured skin or mucosal surfaces during licking.

2) **Through the respiratory tract**

- This is the second most common mode of transmission.
- Infection via the respiratory tract occurs from contact with contaminated dust or infectious droplets (aerosol dust).

575. Non-motile bacterium is -

a) Vibrio

b) Clostridium septicum

c) Clostridium perfringens

d) Legionella

Correct Answer - C

Ans. is 'c' i.e., Clostridium perfringens [Ref Ananthanarayan 9th/e p.262, 263, 252-257]

All clostridia are motile by peritrichous flagella except C/ tetani VI and CI perfringens which are non-motile.

576. Ehrlichia phagocytophila mainly affects -

a) RBC

b) Platelets

c) Neutrophils

d) Macrophages

Correct Answer - C

Ans. is 'c' i.e., Neutrophils [Ref Essentials of clinical microbiology p. 712]

- Anaplasma phagocytophilum (formerly known as Ehrlichia phagocytophila) is a causative agent of tick-borne fever in sheep and pasture fever in cattle.
- It is an obligate intracellular bacterium whose main target is neutrophils but it can also infect monocytes.

577. Which viral gene acts as carcinogen in causing carcinoma cervix -

a) P 24 - gene

b) E - gene

c) L - gene

d) H - gene

Correct Answer - B

Ans. is 'b' i.e., E-gene [Ref Harrison 15th ed p. 1199-1200]

- HPV is the most important cause of cervical cancer.
- Products of E-genes (E6, E7) are related to immortalization or malignant transformation of keratinocytes by interfering with p53 and Rb genes, respectively

578. Which of the following can infect ovary -

a) Mumps virus

b) EBV

c) CMV

d) Measles virus

Correct Answer - A

Ans. is 'a' i.e., Mumps virus [Ref Clinical microbiology p. 273]

- Mumps begins as a primary infection in the respiratory tract and spreads by viremia to glandular tissues including the salivary glands, pancreas, testes and ovaries.

579. Integration of viral genome into host cell chromosome can leads to -

a) Malignancy

b) Latency

c) Altered growth

d) All of the above

Correct Answer - D

Ans. is 'd' i.e., All of the above [Ref Clinical microbiology p. 312]

- Integration of viral genomes into host cell chromosome can cause alteration in :
 1. Host cell surface
 2. Metabolic function
 3. Cell growth and replication pattern
 4. Malignant transformation
 5. Latent infection

580. Not true about paramyxoviruses -

a) Belong to family myxovirus

b) Are DNA viruses

c) Have linear nucleic acid

d) Antigenically stable

Correct Answer - B

Ans. is 'b' i.e., Are DNA viruses [Ref Ananthanarayan 9th e p. 497-498]

- Myxoviruses are enveloped RNA viruses.
- They are characterized by ability to adsorb on to mucoprotein (affinity for mucin) on erythrocytes causing agglutination of erythrocytes.
- Major route of infection of all these virus is respiratory route by droplet infection.
- Myxovirus are divided into two important families ?
 - .. Orthomyxovirus → Influenza
 - .. Paramyxovirus → Mumps, measles, RSV, Parainfluenza virus

581. HTLV-1 can be transmitted by -

- a) Blood transfusion
- b) Droplet inhalation
- c) Contaminated water
- d) Animal bite

Correct Answer - A

Ans. is 'a' i.e., Blood transfusion [Ref Manual of clinical microbiology Vol.1 p.1131]

HTLV-1 and HTLV-2 infections are transmitted by?

- 1. Sexually (mainly by males to female)
- 2. Vertically (from mother to child by prolonged breast feeding)
- 3. Parenterally (through drug use and blood transfusion)

582. Thymus dependent area in spleen -

- a) Mantel layer
- b) Perifollicular region
- c) Malphigian corpuscle
- d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Malphigian corpuscle

Thymus dependent (T-cells collect)

1. Spleen

- Periarterial lymphoid collect
- Malphigian corpuscle in white pulp
- 2. Lymph node**
- Paracortical area

Thymus independent (B-cells collection)

1. Spleen

- Perifollicular region
- Mantel layer
- 2. Lymph node**
- Cortical follicles
- Germinal centres
- Medullary cords

583. Precipitation in comparison to agglutination requires -

- a) Less pH
- b) High temperature
- c) Specific enzyme
- d) Soluble antigen

Correct Answer - D

Ans. is 'd' i.e., Soluble antigen [Ref Ananthanarayan 9th ed p. 105]

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584. Common variable deficiency is due to -

- a) Absent B cells
- b) Reduced number of B cells
- c) Defective B cell differentiation
- d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Defective B cell differentiation [Ref: Robbin's 9^m/e p. 241 & 8th/e p. 233]

Most patients with common variable immunodeficiency have normal or near-normal numbers of B cells in the blood and lymphoid tissues. These B cells, however, are not able to differentiate into plasma cells.

The clinical manifestations are caused by antibody deficiency. The feature common to all patients is hypogammaglobulinemia, generally affecting all the antibody classes but sometimes only IgG.

585. CD3 is a marker for?

a) B - cells

b) T - cells

c) NK - cells

d) Monocytes

Correct Answer - B

Ans. is 'b' i.e., T - cells [Ref : Robbin's 9th/e p. 590 & 8⁵/e p. 600 table (13.5)]

CD-3 is known as Pan T-cell marker.

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586. In Rideal walker method, plates are incubated for ?

a) < 2 days

b) 2-3 days

c) 6-8 days

d) > 10 days

Correct Answer - B

Ans. is 'b' i.e., 2-3 days [Ref Textbook of sterilization e.7 disinfection p.233]

In Rideal walker method, for checking efficiency of disinfectant, bactericidal activity is determined against salmonella typhi suspension.

Subcultures are performed from both the test and phenol at intervals of 2.5, 5, 7.5 and 10 minutes.

The plates are incubated for 48-72 hours at 37°C.

587. ABO non- secretors are more prone to ?

a) Infection

b) Autoimmunity

c) Heart disease

d) Carcinoma

Correct Answer - A:B:C

Ans. is 'a' i.e., Infection, 'b' i.e., Autoimmunity & 'c' i.e., Heart disease [Ref www.dadamo.com]

There are two types of people (independent of blood group)

- Secretor: These persons secrete their blood group antigen into other body fluids like saliva etc.
- Nonsecretor: They do not secrete their blood group antigen into body fluids.
- Non-secretors appear to have an increase in prevalence of a variety of autoimmune disease like ankylosing spondylitis, reactive arthritis, Graves disease and Sjogren's syndrome.
- Non - secretors are at a greater risk of developing diabetes, MI and heart disease.
- Non-secretors are at a greater risk for recurrent urinary tract infections and candida infection.
- Non-secretors have more oral diseases and more digestive problems.

588. Rose waaler test is -

- a) Complement fixation test
- b) Pricipitation in gel
- c) Ring precipitation
- d) Passive hemagglutination test

Correct Answer - D

Ans. is 'd' i.e., Passive hemogglutination test [Ref Ananthanarayan ^{8th} /e p. 107, 108, Harrison ^{18th}/e p. 1469, 1470]

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589. Prevention of catheter induced urinary tract infection is by ?

- a) Prophylactic antibiotics
- b) Use of face mask
- c) Closed drainage technique
- d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Closed drainage technique [Ref Microbiology in clinical practice p.450]

Prevention of catheter-associated infection depends on:

1. Aseptic catheter techniques.
2. Antiseptic lubricant containing chlorhexidine and local instillation of 1% chlorhexidine into the bladder.
3. Closed drainage cathater technique.
4. Excellent hand washing techniques, using chlorhexidine detergent and good drying of hands.
5. Use of gloves and isolation of patients with infections due to multiple antibiotic-resistant strains.

590. Example of precipitation test is

a) Rose waaler test

b) Widal test

c) Latex agglutination

d) Kahn test

Correct Answer - D

Ans. is 'd' i.e., Kahn test

- It is a Heterophile tube agglutination test, used to diagnose Rickettsiae.

591. Morula form is seen in which infection ?

a) Chlamydiae

b) Bartonella quintana

c) Mycoplasma hominis

d) Ehrlichia

Correct Answer - D

**Ans. is 'd' i.e., Ehrlichia [Ref Ananthanarayan^h le p. 409;
Vasanthakumari p.310]**

Ehrlichiae grow within phagosomes of phagocytes as mulberry-like clusters called morula.

592. Which of the following is not an in vivo test ?

a) Elek's gel precipitation test

b) Schick test

c) Lepromin test

d) Tuberculin test

Correct Answer - A

Ans. is 'a' i.e., Elek's gel precipitation test [Ref Read below]

Elek's gel precipitation is an in vitro test for toxigenicity of C diphtheriae.

Other three options are skin tests (i.e. in vivo tests).

593. Primory T-cell deficiency is -

- a) Ecto- 5' nucleotidase deficiency
- b) Common variable immunodeficiency
- c) DiGeorge syndrome
- d) Wiskott-Aldrich syndrome

Correct Answer - C

Ans. is 'c' i.e., Di George syndrome [Ref: Atlas of immunology p. 537]

I. Cellular immunodeficiencies (T cell defects)

- 1. Thymic hypoplasia (DiGeorge syndrome)
- 2. Chronic mucocutaneous candidiasis
- 3. Purine nucleoside phosphorylase (PNP) deficiency

II. Combined immunodeficiencies (B and T cell defects)

- 1. Cellular immunodeficiency with abnormal immunoglobulin synthesis (Nezelof syndrome)
- 2. Ataxia telangiectasia
- 3. Wiskott-Aldrich syndrome
- 4. Immunodeficiency with thymoma
- 5. Immunodeficiency with short-limbed dwarfism

594. Monoclonal antibody binds to ?

- a) Epitope
- b) Paratope
- c) Both epitope and paratope
- d) None of the above

Correct Answer - A

Ans. is 'a' i.e., Epitope [Ref : Ananthanarayan 9th/e p. 88 & 7^{1*} p. 81; Harrison 18thie p. 2673 & 17th/e p. 2036]

Epitope

- Also known as "antigenic determinant".
- It is antibody binding site of antigen.

595. Oakley - fulthorpe procedure is -

- a) Agglutination test
- b) Precipitation test
- c) Single diffusion in one dimension
- d) Double diffusion in one dimension

Correct Answer - B:D

Ans. is 'd > b' i.e., Double diffusion in one dimension >

Precipitation test [Ref: Ananthanarayan 9th/e p. 105]

Immunodiffusion tests are precipitation reaction in gels.

Important examples of immunodiffusion test are :-

- 1. Oudin procedure -> single diffusion in one dimension.
- 2. Oakley fulthorpe procedure -, Double diffusion in one dimension
- 3. Mancini method or radial immunodiffusion -> Single diffusion in two dimensions.
- 4. Ochterlony procedure -> Double diffusion in two dimensions

596. Complement deficiency has not been implicated in causing ?

a) SLE

b) PNH

c) Hereditary angiodema

d) Membranous nephritis

Correct Answer - D

Ans. is 'd' i.e., Membranous nephritis [Ref Pariza 3rd ed p. 121]

Complement deficiency and disease

- Deficiency of early components (C1, C2, C4) causes immune - complex diseases (e.g. SLE), and pyogenic infections.
- Deficiency of C3 and C3b causes recurrent pyogenic infections.
- Terminal complement component (C₅ through C₉) deficiencies and deficiencies of the alternative pathway (Properdin, C3, Factor D) have a strong effect on susceptibility to, as well as severity of, neisserial infections.
- Inherited deficiency of C₁ esterase inhibitor causes Hereditary angioneurotic edema.
- Acquired deficiency of Decay accelerating factor (DAF) causes Paroxysmal nocturnal hemoglobinuria (PNH). DAF is a regulator in complement system which increases dissolution of C₃ convertase (C4b2a)

597. Molecular mass of IgG [in K Da]

a) 150

b) 400

c) 1000

d) 1500

Correct Answer - A

Ans. is 'a' i.e., 150**Antibody Molecular mass (KDa)**

IgG	150
IgA	160,400
IgM	950,1150
IgD	175
IgE	190

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598. Lattice phenomenon is seen in -

- a) Neutrilization reaction
- b) Complement fixation test
- c) Precipitation test
- d) All of the above

Correct Answer - C

Ans. is 'c' i.e., Precipitation test [Ref Textbook of clinical microbiology p.785]

The lattice hypothesis was proposed by marrack (1934) to explain the mechanism of precipitation.

According to this concept, multivalent antigens combine with bivalent antibodies in varying proportion depending on the antigen-antibody ratio in the reacting mixture.

Precipitation results when large lattice is formed consisting of alternating antigen and antibody molecules. This is possible only in the zone of equivalence.

In the zone of antigen or antibody excess, the lattice does not enlarge, as the valencies of the antibody and the antigen, repectively are fully satisfied. In either cases extensive lattice cannot be formed and precipitation is inhibited.

The lattice hypothesis holds good for agglutination also.

599. Haptens are immunogenic when they covalently bind to -

- a) Lipid carrier
- b) Polysaccharide carrier
- c) Protein carrier
- d) Any of the above carrier

Correct Answer - C

Ans. is 'c' i.e., Protein carrier [Ref Essentials of microbiology p. 91]

Hapten

- Hapten is a substance, which itself is unable to induce antibody synthesis, i.e non-immunogenic but may be able to react specifically with antibody. Thus, hapten can function as antigen but not as immunogen.
- Haptens are incomplete antigens , which become complete antigens when they covalently combine with carrier molecule or schleper. After combination with carrier molecule, it becomes complete antigen and can induce an immune response.

600. IgM appears in fetus at what gestational age -

a) 10 weeks

b) 20 weeks

c) 30 weeks

d) at birth

Correct Answer - B

Ans. is 'b' i.e., 20 weeks

- IgM is the earliest immunoglobulin class to be synthesized by the fetus, beginning at 20 weeks of age.

601. The serum concentration of which of the following human IgG subclass is maximum ?

a) IgG 1

b) IgG 2

c) IgG 3

d) IgG 4

Correct Answer - A

Ans. is 'a' i.e., Ig G₁ [Ref Ananthanarayan 9th/ep. 97 & 8th/e p. 98; Harrison 19^m/e p. 372 & 18thVe p. 2674]

602. Which is specific for acquired immunity ?

a) Immunological memory

b) Affected by genetic makeup

c) No antigen exposure

d) All of the above

Correct Answer - A

Ans. is 'a' i.e., Immunological memory [Ref Harrison 19th/e p. 372]

Acquired (adaptive) immunity is found only in vertebrates

It is based on the generation of antigen receptors on T and B lymphocytes by germ line gene rearrangements.

It is specific.

It is developed as a result of an antigenic stimulus (Immunological priming) or by passive transfer of antibodies.

It provides immunological memory; subsequent antigen exposure leads to more rapid and vigorous immune responses.

The adaptive immune system consists of dual limbs of cellular and humoral immunity.

603. Example of neutrilization reaction -

a) VDRL

b) Widal test

c) Kahn test

d) Nagler reaction

Correct Answer - D

Ans. is 'd' i.e., Nagler reaction [Ref Ananthanarayan 9th/e p.112]

Important neutralization tests are Nagler reaction, dick test and schick test.

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604. Which does not stimulate active immunity -

- a) Subclinical infection
- b) Clinical infection
- c) Vaccination
- d) Transplacental antibody in newborn

Correct Answer - D

Ans. is 'd' i.e., Transplacental antibody in newborn [Ref Ananthanarayan 9th/e p. 81-83]

Adaptive (acquired) immunity is of following types :?

1) Active immunity

- It is so called because host's immune system actively produce immunity.
- Antigenic stimulus induces the immune system to produce antibodies or cellular immune response.

Active immunity may be :-

- 1. Natural : Due to infection (either clinical or subclinical /inapparent)
- 2. Artificial : Vaccination (immunization)

2) Passive immunity

- It is so called because antibodies are produced in another organism and then received passively by the host.

Passive immunity may be :-

- 1. Natural : Transport of antibodies across the placenta from mother to fetus.
- 2. Acquired : Administration of immunoglobulin/Antibody.

605. Which of the following is not true regarding amoebic liver abscess

- a) Multiple abscesses is more common
- b) May rupture into the pleural cavity
- c) For asymptomatic luminal carriers diloxanide furoate is the drug of choice
- d) Mostly involving the right lobe of liver

Correct Answer - A

Ans. is 'a' i.e., Multiple abscesses are more common

- Amoebic liver abscess is the most common extra-intestinal manifestation of amoebiasis.
- It is the involvement of **liver** tissue by trophozoites of the organism *Entamoeba histolytica* and of its **abscess** due to necrosis.
- Most common in the posterosuperior surface of the right lobe. Usually, there is one large solitary abscess.-
- The necrotic contents of liver abscess are classically described as anchovy-sauce pus.
- Pleuropulmonary involvement of the most frequent complication of amoebic liver abscess.
- ALA is usually solitary and pyogenic liver abscess is usually multiple.
- Multiple ALA, although rare, are frequently confused with pyogenic liver abscess.
- However, Tayal et al., from India showed that the existence of multiple ALA is not uncommon as previously thought and superinfection or co-infection with pyogenic organisms is common in such cases.

Treatment

Treatment depends on the type of infection:

- 1) Asymptomatic carrier --> Luminal agents (Iodoquinol, Paromomycine) --> Diloxanide furoate is the DOC.
- 2) Acute colitis(dysentery) --> Metronidazole or Tinidazole + Luminal agent.
- 3) Liver abscess --> Metronidazole or Tinidazole or Ornidazole + Luminal agent.

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606. Gene responsible for mutation of HBV is ?

a) X gene

b) S gene

c) P gene

d) C gene

Correct Answer - D

Ans. is- D- i.e., C gene

- Two categories of naturally occurring HBV variants have attracted the most attention.
- One of these was identified initially in Mediterranean countries among patients with an unusual serologic clinical profile. They have severe chronic HBV infection and detectable HBV DNA but with anti-HBe instead of HBeAg.
- These patients were found to be infected with an **HBA mutant that contained an alteration in the pre-core region rendering the virus incapable of encoding HBeAg.**
- Another **mutation, in the core-promoter region,** prevents transcription of the coding region for HBeAg and yields an HBeAg-negative phenotype.
- Patients with such mutations in the pre-core region and who are unable to secrete HBeAg tend to have severe liver disease **that progresses more rapidly to cirrhosis, or they are identified clinically** later in the course of the natural history of chronic hepatitis B when the disease is more advanced.
- Both "wild-type" HBV and pre-core-mutant HBV can coexist in the same patient, or mutant HBV may arise late during wild-type HBV infection

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607. The statements regarding falciparum malaria are all except

- a) Haemoglobinuria and renal failure
- b) Hypoglycemia
- c) Cerebral malaria
- d) Adequately prevented with chloroquine therapy

Correct Answer - D

Ans. is 'd' i.e., Adequately prevented with chloroquine therapy [Ref CMDT-14 Chapter 35 p.1491]

- Most species of *P. falciparum* are resistant to chloroquine (so, it does not effectively prevent *P. falciparum* malaria).

***P falciparum* malaria can cause :-**

1. Cerebral malaria with impaired consciousness.
2. Black water fever causing hemolysis, hemoglobinuria and renal failure.
3. Hypoglycemia
4. Bleeding
5. Pulmonary edema
6. Acidosis

608. Eggs discharged in urine

a) *S. mansoni*

b) *S. japonicum*

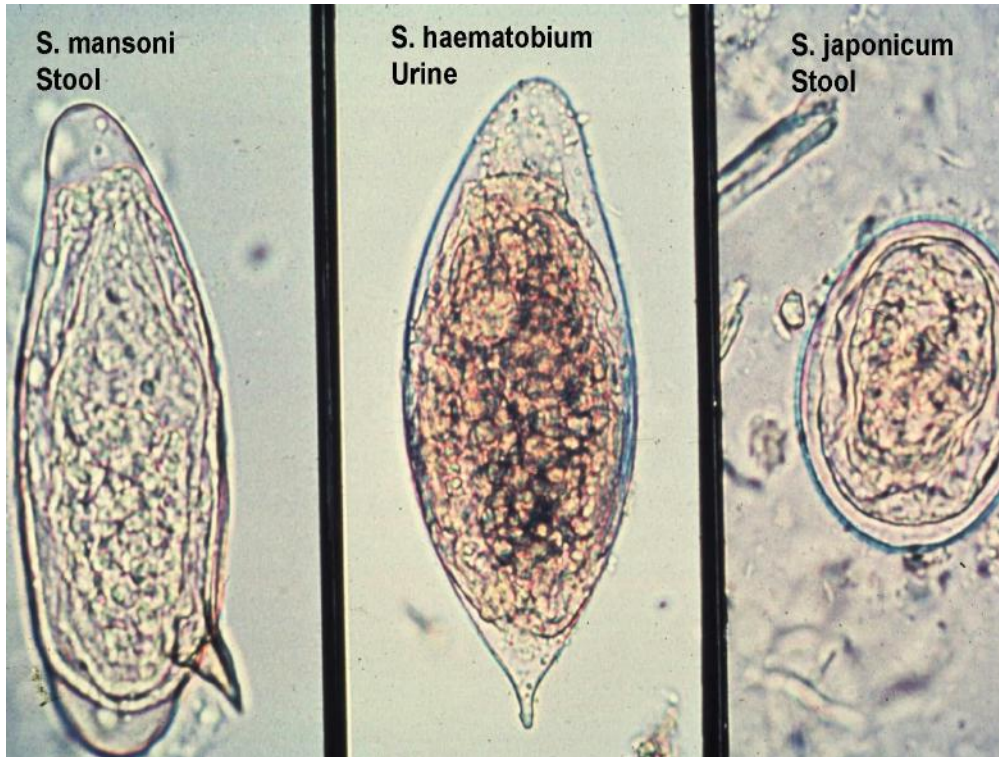
c) *S. haematobium*

d) All

Correct Answer - C

Ans. is 'c' i.e. *S. haematobium*

- 20 mm in length and 0.25 mm in breadth female.
- Elongated 110 -170 μ m long and 40-70 μ m wide eggs, Has a thin, smooth shell, a rounded anterior end and a characteristic terminal spine from the tapered posterior end
- Egg discharged in Urine, Infective form is Fork - tailed cercariae that penetrate skin of humans wading in freshwater canals.



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609. Most common site for hydatid cyst

a) Lung

b) Liver

c) Brain

d) Kidney

Correct Answer - B

Ans. is 'b' i.e., Liver [Ref Harrison 18th le p. 1762]

The majority of hydatid cysts occur in the liver,
Liver cysts occur more frequently in the right lobe.

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610. A child come with fever, cold, cough, membrane over tonsils; nasal swab is taken, culture should be done on which medium for earliest diagnosis ?

a) Loffelers serum slop

b) L. J. media

c) MC Conkey's Agar

d) Citrate media

Correct Answer - A

Ans. is 'a' i.e., Loffelers serum slop [Ref: Ananthanarayan ele p. 233]

Fever, cold, cough with membrane on tonsils suggest the diagnosis of diphtheria.

For rapid growth the specimen is inoculated on Loeffler's serum slop. Diphtheria bacilli grow on Loeffler's serum slope very rapidly and colonies can be seen in 6-8 hours, long before other bacteria grow

611. What is p24 ?

a) Envelop antigen in HIV

b) Core antigen in HIV

c) Genome of HIV

d) Shell antigen

Correct Answer - B

Ans. is 'b' i.e., Core antigen in HIV [Ref Ananthanarayan 8thie p. 571]

A. Envelop antigens

- Spike antigen - gp 120 (Principal envelope antigen)
- Transmembrane pedicle protein - gp 41
- B. Shell antigen
- Nucleocapsid protein - p 18
- C. Core antigens
- Principal core antigen - p 24
- Other core antigens - p 15, p 55
- Polymerase antigens - p 31, p 51, p 66

612. Invasive infections caused by all except ?

a) Shigella

b) Salmonella

c) V. cholerae

d) Yersinia

Correct Answer - C

Ans. is 'c' i.e., V. cholerae [Ref Harrison text p. 1084]

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613. A child with fever with ABCs & pus in stools, causative organism is ?

a) ETEC

b) EHEC

c) EPEC

d) EAEC

Correct Answer - B

Ans. is 'b' i.e., EHEC [Ref Harrison 18th ed p. 1084]

Fever with RBC and pus in stools suggest inflammatory diarrhea. Amongst the given options EHEC causes invasion.

614. Painless genital ulcer in male with everted margin is seen in ?

a) Syphilis

b) Chancroid

c) Herpes

d) LGV

Correct Answer - A

Ans. is 'a' i.e., Syphilis [Ref Harrison 18th/e p. 1382, Jawetz 22nd/e p. 642]

Painless indurated ulcer with everted margins, h/o of sexual exposure and lack of systemic symptoms favours the diagnosis of syphilis.

615. Which organism can be isolated from stool & sputum -

a) Paragonimus

b) Fasciola

c) Clonorchis

d) P. carini

Correct Answer - A

Ans. is 'a' i.e., Paragonimus [Ref Rajesh karyakarte p. 212]

Two organism can be isolated from both sputum and stool :-

- .. Trophozoite of E. histolytica
- ?. Eggs of Paragonimus

616. Largest intestinal protozoa is ?

a) E. coli

b) Balantidium coli

c) Giardia

d) T. gondii

Correct Answer - B

Ans. is 'b' i.e., Balantidium coli [Ref Paniker p. 111]

Largest protozoa	Balantidium coli
Smallest intestinal amoeba	Dientamoeba fragilis
Smallest tapeworm found in human intestine	H. nana
Largest helminth (largest worm)	T. saginata (beef tapeworm)
Largest liver fluke	F. hepatica
Largest trematode infecting man →	Fasciolopsis buski
Largest Nematode	Ascaris
Smallest Nematode -	Trichinella
Only protozoan parasite found in small intestine of man	Giardia lamblia
Only ciliate protozoan parasite of man -	Balantidium coli
Parthenogenic worm (female is able to produce fertile eggs or larvae without fertilization)	Strongyloides stercoralis.

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617. Rhabditiform larvae is seen in ?

a) *Tenia solium*

b) *Strongyloides*

c) *D. latum*

d) *Trichinella*

Correct Answer - B

Ans. is 'b' i.e., *Strongyloides* [Ref Panikar 6th/e p. 171]

Rhabditiform larva is the first stage feeding larva found in some nematodes. It is non-infective.

Filiform larva is the non feeding infective larva in some nematodes.

Rhabditiform larva and filiform larva are found in following important nematodes

618. Burkholderia cepacia is resistant to which of the following drugs:

a) Ceftazidime

b) Trimethoprim-sulfamethoxazole

c) Temocillin

d) Cefotetan

Correct Answer - D

Answer: D. Cefotetan

B. cepacia complex strains are intrinsically resistant to a wide range of antimicrobial agents, including aminoglycosides, polymyxin, first and second generation cephalosporins, and carboxypenicillins

Antimicrobial agents that are effective against B. cepacia complex include meropenem, ceftazidime, piperacillin, temocillin, and trimethoprim-sulfamethoxazole.

619. Shingles Is caused by which of the following ?

a) Varicella-zoster

b) Herpes simplex

c) CMV

d) None

Correct Answer - A

Ans. A. Varicella-zoster

Shingles, also called herpes zoster, is a painful skin rash.

Shingles is caused by reactivation of the varicella zoster virus, the same virus that causes chickenpox.

620. Urea breath test is used for diagnosis of:

a) H.pylori

b) Campylobacter jejuni

c) E. coli

d) Lactobacillus

Correct Answer - A

Answer: A. H.pylori

The urea breath test is a rapid diagnostic procedure used to identify infections by *Helicobacter pylori*, a spiral bacterium implicated in gastritis, gastric ulcer, and peptic ulcer disease. It is based upon the ability of *H. pylori* to convert urea to ammonia and carbon dioxide

621. Hyperacute graft rejection occurs after how much time?

a) 24 hours

b) 2 weeks right

c) In minutes

d) Years

Correct Answer - C

Answer: C. In minutes

Hyperacute Transplant Rejection occurs almost immediately and is often evident while you are still in surgery. It is caused by accidental ABO Blood type mismatching of the donor and recipient which almost never happens anymore. Acute onset is in few weeks to month. Chronic onset is from months to years.

622. Australian antigen for hepatitis b is?

a) Hb S ag

b) Hb E ag

c) Hb D ag

d) HbV Dna

Correct Answer - A

Answer: A. Hb S ag

HBsAg (also known as the Australia antigen) is the surface antigen of the hepatitis B virus (HBV). It indicates current hepatitis B infection.

623. Which fungus is most commonly associated with orbital cellulitis in patients with diabetic ketoacidosis.

a) Candida

b) Mucor

c) Aspergillus

d) Rhizopus

Correct Answer - C

Answer: C. Aspergillus

Orbital cellulitis term is reserved for infections behind the orbital septum which may or may not spill over to lids. Bacterial OC is more common in children and fulminant infection (& ischemic infarction) with Mucor or Aspergillus typically affect patients with diabetes (esp ketoacidosis) and immunosuppression. Presentation is Extensive swelling of lids with chemosis often obscure proptosis (i.e. most commonly lateral & downwards). Proptosis with impaired mobility resulting in diplopia Pain is severe, increased by movement of eye or pressure Unilateral, tender, warm & red periorbital edema, painful ophthalmoplegia.

624. Sabin Feldman dye test is used for diagnosis of which of the following condition:

a) Botulism

b) Toxoplasmosis

c) Sarcoidosis

d) Yellow fever

Correct Answer - B

Answer: B. Toxoplasmosis

A **Sabin–Feldman dye** test is a serologic test to diagnose for toxoplasmosis

625. Acute Hemorrhagic Conjunctivitis is caused by which of enterovirus type ?

a) 69

b) 68

c) 70

d) 71

Correct Answer - C

Answer: C. 70

Acute hemorrhagic **conjunctivitis** (AHC) is characterized by **conjunctival** congestion, vascular dilatation, and onset of edema. Serologic studies have been useful in showing the presence of neutralizing antibodies to Coxsackie group A24 (CA24) and enterovirus **E70 (EV70)** strains as the causative agent.

626. Echinococcus granulosus are commonly seen in which of the given animals:

a) Dog

b) Cat

c) Fox

d) Pig

Correct Answer - A

Answer: A. Dog

Echinococcus granulosus, also called the hydatid worm, hyper tape-worm or **dog** tapeworm. Domestic **dogs** (*Canis familiaris*) have been recognised as the definitive host of the parasite.

627. An anaerobe causing multiple abscess with discharging sinuses, demonstrating sulphur granules in pus is?

a) Actinomycetes

b) Nocardia

c) Salmonella

d) Tularemia

Correct Answer - A

Answer: A. Actinomycetes

Actinomycosis is a rare subacute to chronic infection caused by the gram-positive filamentous non-acid fast anaerobic to microaerophilic bacteria, *Actinomyces*.

*The chronic form has multiple abscesses that form sinus tracts and are associated with sulfur granules. About 70% of infections are due to either *Actinomyces israelii* or *Actinomyces gerencseriae*.*

The characteristic of the disease is the sulfur granules which are yellow. They are formed primarily by mycelial fragments with some proteinaceous polysaccharide complexes, which act as a resistance mechanism to avoid and inhibit phagocytosis.

Multiple abscess with discharging sinuses, demonstrating sulphur granules in pus are characteristics of actinomycetes

628. Whole blood is used as a sample for which test?

a) Bacteria

b) IGRA

c) Genexpert

d) Virus

Correct Answer - B

Answer: B. IGRA

Interferon-Gamma Release Assays (IGRAs) are whole-blood tests that can aid in diagnosing *Mycobacterium tuberculosis* infection

629. Which organism causing acute bacterial prostatitis ?

- a) Enterococcus
- b) Streptococcus viridans
- c) Peptostreptococcus
- d) E.coli

Correct Answer - D

Answer: D. E.coli

Aerobic gram-negative bacilli are the predominant pathogens in bacterial prostatitis. E. coli **cause** 50%–80% of cases; other pathogens include Enterobacteriaceae (eg, Klebsiella and Proteus, which account for 10%–30% of cases), Enterococcus species (5%–10%)

630. Which of the following organism releases histamine and cause scombroid fish poisoning -

a) Salmonella

b) Staphylococcus

c) P. aeruginosa

d) Weissella

Correct Answer - C

Answer: C. P. aeruginosa

Scombroid poisoning is one of the most common **causes** of morbidity associated with **fish** intake which have not been refrigerated properly from the time they were caught until the time they were served. Bacteria act on compounds in the fish, releasing histamine. Process is induced by enzymes produced by primarily enteric gram-negative **bacteria** (e.g., Morganella morganii, Escherichia coli, Klebsiella species and Pseudomonas aeruginosa) found in the **fish's** cutis and intestines.'.

631. Who is the father of microbiology?

a) A.V.L.hook

b) Robert brown

c) J.C Bose

d) Pasteur

Correct Answer - A

Answer: A. A.V.L.hook

“**Antoni van Leeuwenhoek**” is commonly known as “the Father of Microbiology.”

Antonie Philips van Leeuwenhoek (24th Oct, 1632 – 26th Aug, 1723) is known as 'The Father of Microbiology'. He was known so because of his contributions towards the establishment of microbiology. He was scientist from Delft, Netherlands and is considered to be 'The First Microbiologist in the World'.

leeuwenhoek is called as father of microbiology. He was the first person to see bacteria through his self made single lensed microscope. And he named them “animalcules”. **Louis Pasteur** is know as “father of morden microbiology”.

632. Cutaneous larva migrans caused by which organism?

a) Strongyloides

b) Toxocara canis

c) Ancylostoma braziliense

d) Necator americanus

Correct Answer - C

Answer: C. Ancylostoma braziliense

Cutaneous larva migrans (CLM)

- It is a skin disease in humans, caused by the larvae of various nematode parasites of the hookworm family (Ancylostomatidae).
- The most common species causing this disease in the Americas is Ancylostoma braziliense.
- These parasites live in the intestines of dogs, cats and wild animals and should not be confused with other members of the hookworm family for which humans are definitive hosts, namely Ancylostoma duodenale and Necator americanus.
- Colloquially called creeping eruption due to its presentation, the disease is also somewhat ambiguously known as "ground itch" or (in some parts of the Southern USA) "sandworms", as the larvae like to live in sandy soil.
- Another vernacular name is plumber's itch.
- The medical term CLM literally means "wandering larvae in the skin"

633. After kidney transplantation which organisms infection is more likely to happens -

a) CMV

b) Klebsiella

c) Streptococcus

d) Staphylococcus

Correct Answer - A

Answer: A. CMV

CMV is the most common viral infection after Kidney Transplantation. Most common CMV syndrome in kidney transplant patient is fever (most common), leukopenia, hepatosplenomegaly, myalgia and arthralgia.

634. Vector for zika virus is -

a) Aedes

b) Culex

c) Anopheles

d) None of these

Correct Answer - A

Ans: A. Aedes

Zika virus disease is caused by the **Zika virus**, which is **spread** to people primarily through the bite of an infected mosquito (*Aedes aegypti* and *Aedes albopictus*). The **virus** can also be **transmitted** through sex.

These are the same mosquitoes that spread dengue and chikungunya viruses.

A mosquito gets infected with a virus when it bites an infected person during the period of time when the virus can be found in the person's blood, typically only through the first week of infection.

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635. All of the following is/are having superantigen Property Except

- a) Vibrio cholera
- b) Streptococcal pyrogenic
- c) Staphylococcal enterotoxins
- d) None of these

Correct Answer - A

Answer-A- Vibrio Cholera

SAGs are produced by some pathogenic viruses and bacteria most likely as a defense mechanism against the immune system.

Toxic shock syndrome toxin (TSST-1), epidermolytic toxin and other staphylococcal enterotoxin are superantigens.

These superantigens can bind MHC molecules outside the peptide-binding cleft.

Consequently, superantigen can activate up to 10% of T-cells in a nonspecific manner which in turn leads to the release of large quantities of cytokines.

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636. Type A bioterrorism Agent-

a) Chikungunya

b) Anthrax

c) Hendra

d) Influenza

Correct Answer - B

Answer- B- Anthrax

Category A **agents** - consists of the agents that are considered the highest risk

Included among Category B agents is one that could conceivably threaten water and food safety.

Category C includes pathogens that are considered emerging infectious disease threats and which could be engineered for mass dissemination.

Category A	Category B	Category C
Anthrax	Caliciviruses	Antimicrobial Resistance
Botulism	Chikungunya	Hendra
Dengue	Cholera	Influenza (highly pathogenic strains)
Ebola	E. coli O157: H7	MERS
Hantavirus	Hepatitis A	Nipah
Lassa	Ricin toxin	Prions
Marburg	Salmonella	Rabies
Plague	Typhus fever	SARS
Smallpox	Yellow fever	Tick-Borne encephalitis
Tularemia	Zika	Tuberculosis

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www.FirstRanker.com

637. Culture media used for *E.coli* 0157:H7 is

- a) SMAC
- b) Wilson and Blair medium
- c) Potassium tellurite in Mcleod's medium
- d) Deoxycholate citrate agar (DCA)

Correct Answer - A

Answer- A- SMAC

An enterohemorrhagic bacterial strain, *E. coli* O157: H7 infects the alimentary tract and induces abdominal cramps with hemorrhagic diarrhea. Transmission of *E. coli* O157: H7 occurs via the fecal-oral route after consumption of contaminated, undercooked liquids and foods.

Mac Conkey-Sorbitol ChromoSelect Agar (SMAC) is recommended for selective isolation of *Escherichia coli* O157:H7 from food and animal feeding stuffs.

MacConkey Sorbitol Agar is based on the formulation described by Rappaport and Henigh. The medium contains sorbitol instead of lactose and it is recommended for the detection of enteropathogenic strains of *E. coli* O157:H7 which ferments lactose but does not ferment sorbitol and hence produce colorless colonies.

Sorbitol fermenting strains of *E. coli* produce pink-red colonies. The red color is due to the production of acid from sorbitol, absorption of neutral red and a subsequent colour change of the dye when the pH of the medium falls below 6.8.

<https://www.sigmaaldrich.com/analytical-chromatography/microbiology/microbiology-products.html?TablePage=18297647>

638. Donovanosis is Caused By-

a) *H. ducreyi*

b) *Leishmania donovani*

c) *K. granulomatis*

d) *Treponema pallidum*

Correct Answer - C

Answer- C- *K. Granulomatis*

- **Donovanosis is a sexually transmitted genital ulcer disease.**
- **The bacterium that causes donovanosis (*Klebsiella granulomatis*) infects the skin around the genitals, groin or anal area and causes ulcers and destruction of the skin.**

639. Fungal Infection which is acquired by traumatic inoculation is?

- a) Sporothrix
- b) Blastomycosis
- c) Coccidioides
- d) Paracoccidioides

Correct Answer - A

Answer-A- Sporothrix

Sporothrix schenckii is a thermally dimorphic fungus that lives on vegetation. It is associated with a variety of plants, grasses, trees, sphagnum moss, rose bushes, and other horticultural plants.

The conidia or hyphal fragments of *S.schenckii* are introduced into the skin by trauma.

Following a traumatic introduction into the skin, *S.schenckii* causes sporotrichosis, a chronic granulomatous infection.

This manifestation mimics chronic cavitary tuberculosis and tends to occur in patients with impaired cell-mediated immunity.

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640. Which of the following is not involved in urethritis

a) Trichomonas

b) H.ducreyi

c) Chlamydia

d) Gonococcus

Correct Answer - B

Answer-B- H.ducreyi

Bacteria that commonly cause urethritis to include:

- E. coli and other bacteria present in the stool
 - Gonococcus, which is sexually transmitted and causes [gonorrhea](#).
 - Chlamydia trachomatis, which is sexually transmitted and causes [chlamydia](#).
 - The [herpes simplex](#) virus (HSV-1 and HSV-2) can also cause urethritis. Trichomonas is another cause of urethritis
- <https://www.webmd.com/a-to-z-guides/urethritis-symptoms-causes-treatments#1> ; Jawetz 27/e-pg-746**

641. A patient complains about nausea, vomiting and stomach cramps after attending a social gathering party, which causative organism is likely responsible for Food Poisoning within 3 hours.

a) Staphylococcus aureus

b) Salmonella

c) Clostridium botulinum

d) Clostridium perfringens

Correct Answer - A

Answer- A- Staphylococcus aureus

Staph food poisoning is characterized by a sudden start of nausea, vomiting, and stomach cramps. Most people also have diarrhea. Symptoms usually develop within 30 minutes to 6 hours after eating or drinking an item containing Staph toxin and last no longer than 1 day. Severe illness is rare.

The illness cannot be passed from one person to another.

<https://www.cdc.gov/foodsafety/diseases/staphylococcal.html>

642. A 46-year-old woman with HIV complains severe persistent diarrhea, Histological Investigation was performed, Identify the organism causing diarrhea in HIV Patient.

a) Cryptosporidium

b) Staphylococcus aureus

c) Salmonella

d) Clostridium botulinum

Correct Answer - A

Answer-A- Cryptosporidium

* The origin of infectious diarrhea in patients with AIDS can be divided into 2 general categories: that caused by common pathogens and that caused by opportunistic pathogens.

* The most common infectious organisms causing AIDS-related diarrhea include

- Cytomegalovirus (CMV)
- The parasites Cryptosporidium,
- Microsporidia
- Giardia lamblia

* And the bacterium Mycobacterium avium-intracellulare (MAC).

* Other bacteria and parasites that cause diarrheal symptoms in otherwise healthy people may cause more severe, prolonged or recurrent diarrhea in people with HIV or AIDS

<https://aidsinfo.nih.gov/news/175/aids-related-diarrhea>

643. Organism Causing LGV

a) *Chlamydia trachomatis*

b) *Neisseria gonorrhoeae*

c) *Treponema pallidum*

d) *Haemophilus ducreyi*

Correct Answer - A

Answer- A- *Chlamydia trachomatis*

Lymphogranuloma venereum (LGV) is a long-term (chronic) infection of the lymphatic system.

It is caused by any of the 3 different types (serovars) of the bacteria *Chlamydia trachomatis*.

The bacteria are spread by sexual contact. The infection is not caused by the same bacteria that cause genital [chlamydia](#).

Chlamydia trachomatis causes eye (conjunctivitis, trachoma), respiratory (pneumonia), and genital tract (urethritis, lymphogranuloma venereum) infections.

Diagnosis made with the nucleic acid test for *C.trachomatis*, LGV serovars diagnosed serologically.

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644. Which interleukin responsible for producing IgE from B cells

a) IL 1

b) IL 3

c) IL 4

d) Both B & C

Correct Answer - C

Answer- C, IL 4

IgE is produced by plasma cells located in lymph nodes draining the site of [antigen](#) entry or locally, at the sites of allergic reactions, by plasma cells derived from germinal centers developing within the inflamed tissue.

IgE [antibody](#) production requires [TH2 cells](#) that produce interleukin-4 ([IL-4](#)) and IL-13 and it can be inhibited by [TH1 cells](#) that produce interferon- γ ([IFN- \$\gamma\$](#)).

<https://www.ncbi.nlm.nih.gov/books/NBK27117/>

645. HbsAg is based on which principle

- a) Immunochromatography assays
- b) Chemiluminescence
- c) ELISA
- d) Immunofluorescence

Correct Answer - A

Answer- A- Immunochromatography assays

HBV chronic carriers are those in whom HBsAg persists for more than 6 months in the presence of HBeAg or anti-HBe. HBsAg may persist for years after the loss of HBeAg. The most useful detection methods are enzyme-linked Immunosorbent assay for HBV antigens and antibodies and PCR for viral DNA -**Jawetz 27/e pg-504**

Serological assays detect the host immune response (antibodies to HCV) or a viral antigen (HBsAg, HCVcAg). They are based on the immunoassay principle and are available in the form of rapid diagnostic tests (RDTs) or laboratory-based enzyme immunoassays (EIAs), chemiluminescence immunoassays (CLIAs) and electrochemiluminescence immunoassays (ECLs).-

<https://www.ncbi.nlm.nih.gov/books/NBK442281/>

646. Nosocomial Infection occurs within?

a) A- 48

b) B. 72

c) C. 24

d) D. 50

Correct Answer - A

Answer- A- 48 hours

A hospital-acquired infection (HAI), also known as a nosocomial infection, is an infection that is acquired in a hospital or other health care facility.

Nosocomial infections can be defined as those occurring within 48 hours of hospital admission or within 3 days of discharge or 30 days of operation.

Some well known nosocomial infections include:

- ventilator-associated pneumonia,
- Methicillin-resistant Staphylococcus aureus,
- Candida albicans,
- Acinetobacter baumannii,
- Clostridium difficile,
- Tuberculosis,
- Urinary tract infection, Vancomycin-resistant Enterococcus, and Legionnaires' disease.

<https://www.ncbi.nlm.nih.gov/books/NBK441857/>

647. Which of the following cell components produced by *Neisseria gonorrhoeae* is responsible for attachment to host cells?

a) Lipooligosaccharide

b) Pili (fimbriae)

c) IgA1 protease

d) Outer membrane porin protein

Correct Answer - B

Answer- B- Pili (fimbriae)

Pili are hair-like appendages that extend up to several micrometers from the gonococcal surface. They enhance attachment to host cells and resistance to phagocytosis. They are made up of stacked pilin proteins.

The amino terminal of the pilin molecule, which contains a high percentage of hydrophobic amino acids, is conserved. The amino acid sequence near the midportion of the molecule also is conserved; this portion of the molecule serves in an attachment to host cells and is less prominent in the immune response.

The amino acid sequence near the carboxyl-terminal is highly variable; this portion of the molecule is most prominent in the immune response. The pilins of almost all strains of *N. gonorrhea* are antigenically different, and a single strain can make many antigenically distinct forms of pilin

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