

Q.P. Code: 215001
Reg. no.:

**Second Professional MBBS Degree Regular/Supplementary Examinations
December 2024
Microbiology Paper I**

Time: 3 Hours
Total Marks: 100

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary

1. Multiple Choice Questions
(20x1=20)

The Answers to MCQ questions (Q.No. i to Q.No. xx) shall be written continuously on the first two writing sheets (ie Page No. 3 & 4) only

Read the following clinical history and select the most appropriate response for questions (i) -(v)

A 7 year old girl presented with swollen red tender joints which migrate from one joint to the other (knees, ankles, hips and elbows) over a period of hours. She also complained of painless lumps beneath the skin overlying bony prominences. She had shortness of breath and on auscultation, murmur was heard over mitral valve area. ECG showed prolonged P-R interval. On enquiry, it was found that the child had repeated episodes of sore throat over a period of 1 year, the last one being 3 weeks back.

- i. The probable clinical diagnosis is
 - a) Endocarditis
 - b) Functional mitral regurgitation
 - c) Rheumatic heart disease
 - d) Mitral valve prolapse
- ii. The etiological agent in the above diagnosis is
 - a) *Streptococcus pyogenes*
 - b) *Streptococcus agalactiae*
 - c) *Staphylococcus aureus*
 - d) *Staphylococcus epidermidis*
- iii. The serological test used for this condition is
 - a) Coagulase test
 - b) Anti Streptolysin O test
 - c) Bacitracin test
 - d) Antiphosphatase test
- iv. Recurrence of such episodes as in this case can be prevented by prophylaxis with
 - a) Vancomycin
 - b) Methicillin
 - c) Cloxacillin
 - d) Penicillin
- v. In the above question, antibiotic treatment should be continued for
 - a) 1 week
 - b) 4 weeks
 - c) 1 year
 - d) 5-10 years

Question numbers (vi)-(x) are multiple response type questions. Read the statements & mark the answers appropriately.

- vi. A marker of sepsis is

1) C reactive protein	2) Procalcitonin	3) Serum lactate	4) Low hemoglobin
a) 1, 2, 3 are correct	b) 1, 3, 4 are correct	c) 2, 3, 4 are correct	d) 1, 2, 4 are correct
- vii. Western blot test for HIV

1) is a supplemental test	2) Is a confirmatory test as it detects antigens of HIV
3) Detects antibodies against HIV	4) is based on immunoblotting technique
a) 1, 2, 3 are correct	b) 1, 2, 4 are correct
c) 1, 3, 4 are correct	d) 2, 3, 4 are correct
- viii. A fact NOT pathognomonic of visceral Leishmaniasis is

1) Trypomastigotes in bone marrow	2) LD bodies in bone marrow
3) Amastigotes in skin smears	4) Trypomastigotes in peripheral blood
a) 1, 2, 3 are correct	b) 2, 3, 4 are correct
c) 1, 3, 4 are correct	d) 1, 2, 4 are correct
- ix. Diethylcarbamazine provocation test is NOT done for

1) Chagas disease	2) Trypanosomiasis	3) Lymphatic filariasis	4) Leishmaniasis
a) 2, 3, 4 are correct	b) 1, 2, 3 are correct	c) 1, 3, 4 are correct	d) 1, 2, 4 are correct
- x. Cutaneous wound infections NOT caused by

1) <i>Vibrio cholerae</i>	2) <i>Vibrio fluvialis</i>	3) <i>Vibrio mimicus</i>	4) <i>Vibrio vulnificus</i>
a) 1, 2, 4 are correct	b) 1, 3, 4 are correct	c) 2, 3, 4 are correct	d) 1, 2, 3 are correct

Question numbers (xi) – (xv) are single response types

- xi. Which of the following can be used to cultivate viruses

a) Blood agar	b) Thioglycollate broth	c) Tissue culture	d) Stuart's medium
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- xii. Fungal filament in skin scrapings can be visualized after digestion using

a) KOH	b) NaOH	c) KCl	d) NaCl
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- xiii. Gram negative bacteria are inherently resistant to

a) Vancomycin	b) Gentamicin	c) Netilmicin	d) Tobramycin
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(PTO)

xiv. An example of extrachromosomal element is

- a) rRNA b) DNA c) Plasmid d) mRNA

xv. Tissue transplantation between identical twins is an example of

- a) Autograft b) Isograft c) Allograft d) Xenograft

Question numbers (xvi) – (xx) consists of two Statements-Assertion (A) and reason (R). Answer these questions by selecting the appropriate options given below.

xvi. A: T lymphocytes confer innate immunity.

R: Dendritic cells act as antigen presenting cells.

- a) Both A and R are true, and R is the correct explanation of A c) A is true but R is false
b) Both A and R are true, and R is not the correct explanation of A d) A is false but R is true

xvii. A: Tumor marker used for the diagnosis of Hepatocellular carcinoma in adult is alpha fetoprotein.

R: Alpha fetoprotein is a protein expressed on normal cells in fetal life but not in adult life normally; exponentially high levels in tumor cells.

- a) Both A and R are true, and R is the correct explanation of A c) A is true but R is false
b) Both A and R are true, and R is not the correct explanation of A d) A is false but R is true

xviii. A: B lymphocytes have immunological memory.

R: Helper T lymphocytes help B lymphocytes make antibodies

- a) Both A and R are true, and R is the correct explanation of A c) A is true but R is false
b) Both A and R are true, and R is not the correct explanation of A d) A is false but R is true

xix. A: Window period in HIV infection is from entry of virus to appearance of symptoms.

R: Guidelines for HIV testing in India have been laid down by National AIDS Control Organisation.

- a) Both A and R are true, and R is the correct explanation of A c) A is true but R is false
b) Both A and R are true, and R is not the correct explanation of A d) A is false but R is true

xx. A: Culture negative endocarditis is seen in infection caused by *Coxiella burnetii*.

R: All culture negative endocarditis are due to prior antibiotic exposure.

- a) Both A and R are true, and R is the correct explanation of A c) A is true but R is false
b) Both A and R are true, and R is not the correct explanation of A d) A is false but R is true

Essays

(2x10=20)

2. A 20 year old male develops redness and swelling over the skin after eating peanuts.

- a) Define and classify hypersensitivity.
b) What is the type of hypersensitivity reaction seen in the above case.
c) Describe the mechanism.
d) Enumerate the clinical manifestations of this type of hypersensitivity and its management.
e) Enumerate the clinical applications of this type of hypersensitivity with two suitable examples.

(3+1+3+1+2)

3. A 45 year old male presented in dermatology OPD with history of an itchy annular lesion over the scalp for the past 20 days, which on examination looked like a fungal infection.

- a) What is the probable clinical diagnosis.
b) What are the appropriate samples to be collected in the above case.
c) Describe, in detail, the laboratory tests that must be done to reach a diagnosis.
d) Enumerate three clinical types of superficial mycoses and their causative agent

(1+1+5+3)

Short Essays

(6X6=36)

4. Central Sterile Supplies Department (CSSD) – draw a schematic diagram of layout and workflow

5. Discuss various mechanisms of autoimmunity.

6. State six differences between active and passive immunity.

7. Classify types of vaccines with one example each. Discuss advantages and disadvantages of different types of vaccines.

(2+4)

8. What is an antibiogram. How is it useful in a hospital.

(2+4)

9. What is virulence. List the different mechanisms of virulence in bacteria. Explain one of them in detail.

(1+ 3+2)

Short Answers

(6x4=24)

10. List 4 disinfectants with respective application in the hospital.

11. How will you advise a health care worker to avoid needle stick injury while collecting blood from patients.

12. List one viral, bacterial, fungal, parasitic opportunistic infection seen in AIDS patients.

13. List four modes of transmission of infection, with one example each.

14. Enumerate the agents causing enteric fever. Name the serological test indicated for the above condition.

In which week of illness should the test be done. What is the gold standard method for diagnosis and in which week of illness is it highly sensitive.

(1+1+1+0.5 +0.5)

15. Define Fever of Unknown Origin (FUO). List six causes of FUO commonly seen in India.

(1+3)
