SCHEME FOR 2ND PROFESSIONAL MBBS EXAMINATION OF WBUHS

MICROBIOLOGY

A. Written Paper: Two Papers, (40+40=80), 2hrs.each paper.

.Paper I -General Bacteriology, Systemic Bacteriology, Immunology.

Paper II –Virology, Mycology, Parasitology.

The four questions in each theory paper will preferably have the following distribution of mark.

Full marks-40, Time-2 hrs..

Q.1. One (out of two) Clinical problem oriented question consisting of 2-4 small segments. Marks for each segment will be indicated separately. =10

Q.2. Three short note type questions (out of four) 4x3=12

Q.3. Three (out of four) short answer type/explanation of statement/difference between/mechanism of action/comment on 4x3=12

Q 4. Three short answer type questions 2x3=6

Answer to each question should be given by the candidates in a separate answer book. Only one examiner will examine all the answer scripts to the same question in that center.

B. Oral /Viva

i) General Bacteriology, Immunology, Systemic Bacteriology -9 marks

ii) Virology, Mycology, Parasitology -6 marks

C. Practical- 25 marks. Time 1.1/2 hr. + 1/2h hr for spotting = 2 hrs.

O	Identification of unknown bacterial culture	-8
O	Ziehl-Neelsen Staining of Sputum smear supplied	-3
O	Microscopical examination of supplied stool smear	-3
O	A serological test by common slide agglutination method	3
O	Laboratory Note Book	-3
O	Spotting	-5

ASSESSMENT CARD

(TO BE KEPT IN THE DEPARTMENT)

Full Marks – Viva voce – 10 X 20 = 200, Practical = 20 X 3 = 60.

Name of student :

Batch : **Roll No :**

Sl. No.	Topics	Oral	Marks Obtained	
	3rd semester		Practical	Signature of Teacher
1.	History, Classification, Morphology & Physiology of Bacterial genetics.			

2.	Sterilization, methods of isolation & identification.			
3.	Gram positive cocci			
4.	Gram negative cocci, corynebacteria			
5.	Mycobacteria			
	4th semester			
6.	Spore bearers			
7.	Enterobacteriaceae			
8.	Vibrios, Pseudomonas & Pravobacteria.			
9.	Spirillum, Actinomycetes, Campylobacter.			
10.	Antigen, Immunoglobulin, Complement.			
11.	Immunity & hypersensitivity.			
12.	Immunodeficiency states & immunological reactions.			
	5th semester			
13.	Spirochetes.			
14.	Rickettsiae, Chlamydia, mycoplasma, general virology.			
15.	D.N.A. viruses.			
16.	R.N.A. Viruses.			
17.	Mycology			
18.	Protozoa			
19.	Nematodes			
20.	Cestodes & trematodes.			

N. B. 1. Students must appear for assessment on scheduled dates, failing which no assessment will be taken on later dates except on special grounds.

Students must keep laboratory note book up to date failing which no student will be allowed for practical assessment.

Signature of the Head of the Department.

ITEM CARD

Name : **College :** **Year :**
Roll No.

DISTRIBUTION OF INTERNAL ASSESSMENT MARKS
THEROTICAL DAY TO DAY ASSESSMENT

GENERAL BACTERI OLOGY	SYSTEMIC BACTERI OLOGY	PROTOZO OLOGY	HELMINT HOLOGY	IMMUNO LOGY	VIRO LOGY	MYCO LOGY	TOTAL	10% OF 75
10	10 10	10	10	10	10	5	75	7.5

PRACTICAL DAY TO DAY ASSESMENT

Microscope & Sterilization	Culture media	Grams' stain	AFB Stain	Stool Exam.	Identification of unknown Culture	Spotting	Serology	Total	10% of 75
10	10	10	10	10	10	10	5	75	7.5

SENT UP EXAMINATION – THEROTICAL					TOTAL THEORITICAL	
Theory 40x2=80	**Oral 20**	**Total Theory + Oral**	**Total Theory + Oral in 75**	**10% of Theory + Oral**	**(1) Day to day Assessment Theoretical-7.5 (2) Sent up Exam. Theory + Oral = 7.5**	**Total (1+2) 7.5+7.5=15**

PRACTICAL					TOTAL PRACTICAL
Internal Assessment Practical 25 (calculated in 75, i.e. 25 X 3)	**10% of Practical (7.5)**	**Day to day assessment Practical 7.5**	**Practical Day to day 7.5**	**Sent up Exam. Pr. 7.5**	**Total (1+2) 7.5+7.5=15**

CURRICULUM & SYLABUS FOR THE MBBS COURSE OF STUDIES

A Duration : 1.5 yrs. 3rd, 4th & 5th Semester

B. Total hours of Teaching : 250 hrs. Comprising of

1) Lecture + Lecture demonstration =	100 x 1 hr	= 100 hrs
2) Practical class	50 x 2 hrs	= 100 hrs
3) Tutorials	25 x 2 hrs.	= 50 hrs.
	TOTAL	=250 hrs

C. Curriculum (Syllabus)

Topic for theoretical Class

1. THEORY

No. hrs.	Topic	Class
1.	Introduction to Microbiology. History and Classification.	One
	Genera1 Bacteriology	
2.	Morphology of Bacteria & Methods of study of Morphology.	Two
3.	Physiology of Bacteria, Metabolism & products thereof	One
4.	Growth requirements of Bacteria, Growth Curve/measurement of growth	One
5.	Sterilization & disinfection	One

6.	Host-parasite relationship	One
7.	Bacterial genetics with variation	One
8.	Antimicrobial agents, mechanism of action, Mechanisms of bacterial drug resistance and Sensitivity Testing.	

IMMUNOLOGY

1.	Introduction to Immunology. Natural & Non-specific Immune Mechanisms	One
2.	Antigen, Hapten, Adjuvants	One
3.	Antibody	One
4.	Complement System	One
5.	Structure & Function of Immune System	Two
6.	Immune response with T -B Cell Co-operation	One
7.	Cytokines with its role in cell mediated Immune response	One
8.	Hypersensitivity and related disorders	Two
9.	Antigen -antibody reactions methodology of testing .	Two
10.	Immune deficiency disorders and autoimmune Diseases	One
11.	Vaccine and scope of Immunotherapy	One

Pathogenic Bacteria and Diseases

1.	Methods of study of bacteria	One
2.	Staphylococcus: Diseases produced, modes of transmission, pathogenesis & diagnosis.	One
3.	Streptococcus: diseases, transmission, pathogenesis, diagnosis Streptopneumonae: epidemiology.	Two
4.	Neisseria: Important species, diseases caused : Pathogenesis, diagnosis, Epidemiology	
5.	Corynebacterium diphtherae: pathogenesis, transmission, diagnosis, Vaccine.	
6.	Listeria, Erysepalothrix, Legionella, etc. Diseases caused, diagnosis.	One

7.	Mycobacterium tuberculosis -Transmission, Pathogenesis, types, immunity Hypersensitivity, interpretation of Results of Mantoux text diagnosis, Vaccine- Leprosy—transmission, features, types diagnosis etc., Role of vaccine Atypical Mycobacteria. Classification, diseases, diagnosis		Two
8.	Actinomyces & Nocardia	: Disease caused, mode of transmission, Diagnosis	
	Aerobic spore-Bearers: Bacillus. Important species, disease caused. Pathogenesis. diagnosis, epidemiology of Anthrax.		One
9.	Nonsporing anaerobes	Bacteroides Sp. etc. : Diseases produced, features, diagnosis.	
10.	Anaerobic Spore bearers	Clostridia- Tetanus, Gas-gangrene, Food poisoning, Botulism : Pathogenesis, infection, transmission, Diagnosis, treatment and prophylaxis.	Three
11.	Enterobactericeae: Diseases caused by E.coli, Klebsiella, Enterobacter etc.		Two
12.	Enteric fever and Salmonella sp: Food poisoning, Pathogenesis, Diagnosis.		Two
13	Shigellosis & Acute Bacillary dysentery		One
14.	UTI and other diseases of proteus sp. Providencia etc.		One
15	Yersinia sp.	- Plague – Pathogenesis Types, diagnosis, epidemiology, food poisoning	One
16.	Vibrios -	Important species, Cholera -pathogenesis, transmission,	
17.	Campylobacter & Helicobacter -Diseases caused, pathogenesis, diagnosis.		One
18.	Pseudomonadeceae	Importance, pathogenesis, diagnosis	One
19.	Haemophilus:	Disease, pathogenesis diagnosis	One
20.	Bordetella sp :	Disease caused, transmission, pathogenesis, diagnosis	One
21.	Brucella sp.: Disease caused, transmission, pathogenesis. diagnosis.		One
22.	Miscellaneous bacteria like Pasteurella, francisella, Streptobacillus, spirilium etc.	: Disease caused epidemiology	One
23.	Spirochetes:	Nonpathogenic spirochetes syphilis yaws, pintas, bejel, leptospirosis, Relapsing fevers & lyme disease	Four
24.	Rickettsial disease	Epidemiology & diagnosis	Two
25. Mycoplasma and Chlamydia: diseases including diagnosis.			Two
26. Normal flora of Human body.			One

VIROLOGY

1. Introduction to virology, general properties of viruses and Classification of viruses — One
2 Replication of viruses, Antiviral agents — One
3. Principles of viral diseases
4. Principles of diagnosis of viral infections — One
5. Common viral vaccines — One
6. Bacteriophage
7. Diseases caused by Herpes viruses, Vericella zoster virus, CMV EBV etc. — One
8. Hepatitis viruses, A,B,C,D,E; Hepatitis A & B properties laboratory diagnosis — One
9. Picorna viruses -and diseases produced with special mention to Pathogenesis of polio diagnosis and prevention. — One
10. Viral gastroenteritis –agents, pathogenesis, diagnosis. — One
11. Rhabdo viruses -General character of Rabies virus, pathogenesis of disease diagnosis prophylaxis. — One
12. Orthomyxo and paramyxo viral diseases (Influenza,' Mumps, Measles Rubella) including vaccines. — One
13(a) Retrovirus -HIV infection & AIDS & other retrovirus;
(b) Oncoviruses -examples & properties & mechanisms of viral etiology of tumor scope of immunotherapy. — One
14(a) Arboviruses and arboviral diseases prevalent in India: epidemiology & diagnosis
(b) Slow viral diseases –etiology, diagnosis — One

MYCOLOGY

1.	Introduction, Classification, principles of laboratory diagnosis	One
2.	Superficial mycosis	One
3.	Subcutaneous mycosis	One
4.	Deep mycosis	One
5.	Opportunistic mycosis	One
		five

PARASITOLOGY .

1.	Introduction, Classification, definition and types of hosts. Definition and types of parasites	One
2.	Intestinal amoebiasis and complications -mode of infection pathogenesis, laboratory diagnosis.	One
3.	Flagellated protozoa -intestinal & genitourinary	One
4.	Haemoflagellates -diseases, life cycle, vector for transmission, laboratory diagnosis (Trypanosomes, leishmania).	One
5.	Malaria -types, parasite -Morph., life cycle, vector, laboratory diagnosis.	Two
6.	Toxoplasmosis and other opportunistic protozoa infections.	One
7.	Classification of helminthes and general characters of nematodes, introduction to intestinal nematodes, strongyloides stercoralis, Ascaris lumbricoides, Hook worm, Trichinella spiralis, Enterobius Vermicularis trichiurae life cycle, disease, laboratory. Diagnosis, epidemiology	Three
8.	Filariasis -diseases, vector, life cycle of parasite Pathogenesis of disease, laboratory diagnosis.	Two
9.	Dracunculosis -life cycle of parasite, mode of infection, epidemiology, laboratory diagnosis.	One
10.	General characters of cestodes, Taeniasis -hosts, mode of infection, life cycle of parasite infection, laboratory diagnosis.	One

11.	Echinococcus granulosus-Morphology,1ife cycle of parasite, mode of infection, prevention ,laboratory diagnosis.	One
12.	D.latum and other cestode infections	One
13.	Trematodes -classification, diseases caused,. Life cycle of schistosomes and general principles of laboratory diagnosis	One

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Nineteen

II. PRACTICAL:

1.	Parts and use of microscope and microscopy	1
2.	Instruments and glass wares used in Microbiology	1
3.	Universal presence of microbes	1
4.	Commonly used media and culture techniques (Media -simple basal media -liquid, solid, enriched media, selective media, enrichment media, Indicator Media) Transport Media, Blood culture media, sugar media, Anaerobic media Name, type, composition, sterilization and use.	2
5.	Sterilization methods used for different purpose- basic principles, instruments/chemical agents used	1
6.	Study of morphology of bacteria :	
	a) Gram staining	2
	b) Albert staining	1
	c) Ziehl-Neelsen staining	2
7.	Study of motility of bacteria by	2
	a) Hanging drop method d) Capillary tube method.	
	b) Cragie's tube method e) Dark-ground microscopy	
	c) Straight loop inoculation method	
8.	Methods of antimicrobial sensitivity testing	1
	a) Disk diffusion (b) Tube dilution	
9.	Study of Staphylococcus aureus and staph. epidermidis. Colony morphology. Pigment production. Gram stain. Motility, Coagulase and otber confirmatory tests including Catalase test.	2
10.	Study of -Gram + cocci	1
	a) Haemolytic properties of Staph., Strepto., Pneumococci	
	b) Gram staining, Morphology, Study of Strepto, Staphylo	
	Neisseria, Pneumococcus, Clostridia.	

11.	Corynaebacterium -	Albert Stain	2
		Media used	
12.	Mycobacterium -	Z -N Stain	3
		Study of charts	
		Confirmatory diagnosis of	
		Tuberculosis & Leprosy	
		D/D Myco. tuberculosis & M. leprae in smear.	
13.	Study of spores -Gram stain, Spore-Stain (Carbol Fuchsin)		1
14.	Study of Stained Smear, Capsule –India Ink staining (Negative - Stain) Carbol Fuchsin (Positive stain), Methods of Anarobiasis.		
15.	Enterobacteriace	(a) E.coli	1
		(Use of media)	
		Colony character	
		Biochemical reactions for	
		Identification of the bact. & Final jdentificajon with antibiogram)	
		(b) Klebsiella sp.	1
		(c) Proteus sp.	1
		(d) Salmonella sp.	1
		(e) Shigella sp	1
16.	Vibrio -Gram Stain Motility test Oxidase Biochemical Reactions.		1
17.	Pseudomonas sp. -Gram Stain. Motility test, Oxidase		1
18.	Serological Tests: VDRL Test RPR		3
	Agglutination -Widal, Latex Agglutination test, ELISA -any common test done.		
19.	Introduction to Parasitology - Types of clinical materials different types of tests done.		2
	Steps of exam. of Stool Smear		
	Steps of exam. of Blood Smear		
	Steps of exam. of marrow Smear.		
20.	Blood Parasites -	Malaria Parasite	1
		L.D.Body	1
		Microfilaria	1
21.	Adult Parasites -	Nematodes	2
		Cestodes	2
		Trematodes	1

22.	Examination of Stool for ova, parasite & Cyst Saline and Iodine preparations.	3
23.	Demonstration of fungus by KOH prepn./ lactophenol cotton blue staining.	1
24.	Demonstration of yeast cells in Gram stains & culture	1
		50

III. Tutorials – 25 x2 hrs =50 hrs

A. Interpretation of laboratory investigation for diagnosis of Infectious disease and correlation between clinical features with aetiological agents to be taken up in the form of charts on diseases of national importance e.g. 14 x 2 Hrs. = 28

a) Tuberculosis
b) Leprosy
c) Cholera
d) Enteric fever
e) Diphtheria
f).Whooping coughs
g) Tetanus
h) Malaria
i) Kala-azar
j) Filaria
k) Dengue
t) Hepatitis B
m) AIDS
n) Hookworm anaemia

B. Clinical Microbiology: 11 x 2 hrs.= 22 hrs

1. Upper respiratory tract. Infections with lab diagnosis
2. Lower respiratory tract infections with lab diag.
3 Bacterial food poisoning with lab. diag.
4 Terminology: gastroenteritis, diarrhoea, dysentery, pseudo membranous colitis diarrhoea and its lab. diag.
5. Dysentery and its lab. diag.
6. Meningitis -types, agents and its lab. diag
7 Terminology of Bacteraemia, Septicaemia, pyaemia and its lab. Diagnosis/ PUO (Blood culture)
8 Urinary tract Infection, organism and its lab. diag.
9. Sexually transmitted diseases list and lab. diag.
10 Hospital acquired infection and its control
11. Bacteriology of milk, water air.

Model Question in Microbiology

2nd Professional MBBS

MICROBIOLOGY

Time :- 2 hours **First -Paper** **Full Marks: 40**

Q1. A 8 year old girl was admitted through emergency because of high fever and limping gait. Her mother states that she developed these symptoms after a bout of sore throat accompanied by high fever three weeks back.

What may be the probable diagnosis? How do you proceed in the microbiological laboratory for finding its aetiological agents? What serological tests do you suggest in this case? 1 +6+ 3 = 10

Or

A 24 years old person was admitted through emergency because of severe dehydration with I sunken eyes following a bout of rice watery stool accompanied with vomiting.

What is this condition?
What are the aetiological agents responsible for this situation?
How do you confirm anyone of the aetiological agents in the laboratory? 1 + 3+6 = 10

Q2. Write short notes on the following (any three) 3 x 4 =12

i) Fimbria and its clinical significance.
ii) Bacterial capsule.
iii) Weil Felix test.
iv) Environmental Mycobacteria.
v) Pyoderma gangrenosum

Q3. Comments on (any three) 3 x 4 = 12

i) A positive mantoux test in an adult has many fallacies.
ii) Antibiogram is must for staphylococcus because of MRSA.
iii) The presence of morphologically similar organisms does not prove the case to be of diphtheria.
iv) The presence of acid fast bacilli in sputum smear should be reported in exact or approximate number because of prognostic value.
v) Apart form pyogenic lesion streptococci may be related to Non pyogenic lesions with grave consequences.

Q4. Differentiate between 3 x 2 = 6

i) Gram positive and gram negative cell wall.
ii) Active and passive immunity.
iii) IgG and IgM.

Second Paper

Time :- 2 hours **Full Marks: 40**

Q1. A twenty five year old male came to you with history of fever and yellow colouration of urine which developed within two to three days. On examination his abdominal examination is quite normal expect tenderness and slight soft enlargement of liver.

What is your diagnosis? .
What are the tests that you will do in microbiological lab to confirm the aetiology?
If the icterus or the symptoms persist beyond six months, what are the serological parameters you will ask for? 1 +6+ 3 = 10

Or

An emaciated young person comes to you with history of fever for three months and pain in the left side of abdomen. On examination he has a huge hepatosplenomegaly with severe anemia.

What may be the condition?
If it is a parasitological disease how do you go for diagnosis in laboratory?
What are the serological tests done for this condition? 1+6+3 = 10

Q2. Write short notes on (any three) 3 x 4 = 12

i) Prion mediated diseases.
ii) Neurological vaccines of Rabies. iii) CD4 and CD8 counts for HIV.
iv) Congenital defects associated with viruses.
v) Infective forms of Giardia lamblia, Ascaris lumbricoides, Enterobius verimicularis.

Q3. Comment on (any three) 3 x 4 = 12

i) Neurological vaccines against Rabies have many problems.
ii) There are many vaccines against Hepatitis viruses used presently.
iii) The floatation concentration technique may be used for ova, cysts etc. iv) The filarial infections can be detected in blood even in daytime.
v) The asexual spores of fungi can be used for diagnosis in superficial dermatological infection.

Q4. Differentiate between 3 x 2 = 6

i) Superficial and subcutaneous dermatophytes.
ii) Virus and Viroids.
iii) Antigenic shift and antigenic drift in influenza viruses.