



# Sri Guru Ram Das University of Health Sciences, Sri Amritsar

## Department of Microbiology

Theory Paper A		Theory Paper B	
Topics	Marks Distribution	Topics	Marks Distribution
General Microbiology	25	Musculoskeletal and Skin and soft tissue infections	15
Immunology	25	CNS infections	20
CVS and Blood infections	20	Respiratory tract infections	25
GIT	15	Urogenital tract infections and STD's	10
Hepatobiliary Infections	10	Zoonotic infections, HIC and Miscellaneous	25
AETCOM	05	AETCOM	05
<b>Total</b>	<b>100</b>	<b>Total</b>	<b>100</b>



# Sri Guru Ram Das University of Health Sciences, Sri Amritsar

## Department of Microbiology

Guidelines for question paper as per the Medical Council of India, Competency Based Undergraduate Curriculum for Indian Medical Graduate.

Theory paper should include questions from core competencies and not from Non Core Competency

### BLUEPRINT OF THEORY PAPER

Sr. No.	Type	Explanation	Topics	Distribution of marks as per weightage
1.	MCQ		<b>10 MCQs for Paper A</b> <b>10 MCQs for Paper B</b>	10 X 1 = 10 10 X 1 = 10
2.	Long essay question	<ol style="list-style-type: none"> <li>The question should pose a Clinical/ Practical problem to the students and require them to apply knowledge and integrate it with disciplines. Avoid giving one liners as questions.</li> <li>Avoid giving one liners as questions.</li> <li>The question stem should be structured and marking distribution should be provided.</li> <li>Use action verbs from higher domains as given in this document.</li> </ol>	<b>Paper A (TWO Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 <ol style="list-style-type: none"> <li>Structured Question</li> <li>Case Based Question</li> </ol> <b>Paper B (Two Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 <ol style="list-style-type: none"> <li>Structured Question</li> <li>Case Based Question</li> </ol>	2 X 10= 20  2X 10= 20

3.	Short Notes	<p>These provide opportunity to sample a wider content, albeit in a short time. The questions should be task oriented rather than 'Write a short note on xxx'.</p> <p>Preferably use verbs (as per List attached) in framing questions and structure them as far as possible</p>	<p><b>Paper A (8 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 Marks for each part should be indicated separately</p>	8 X 5 = 40
			<p><b>Paper B (8 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 Marks for each part should be indicated separately</p>	8 X 5 = 40
4.	Reasoning Questions	<p>These provide excellent opportunities for testing integration, clinical reasoning and analytic ability of the student</p>	<p><b>Paper A (3 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1</p>	3 X 5 = 15
			<p><b>Paper B (3 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1</p>	3 X 5 = 15
5.	Applied Questions	<p>Questions on applied aspect</p>	<p><b>Paper A (3 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1</p>	3 X 5 = 15
			<p><b>Paper B (3 Questions)</b> From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate , VOLUME 1</p>	3 X 5 = 15

**Total Marks 200(Paper A- 100 marks, Paper B-100 marks)**

## DIVISION OF TOPICS

MICROBIOLOGY PAPER A	MICROBIOLOGY PAPER B
<p><b>1. Topics related to general microbiology including:</b></p> <ul style="list-style-type: none"> <li>• General Bacteriology</li> <li>• General Virology</li> <li>• General Parasitology</li> <li>• General Mycology</li> </ul> <p><b>2. Topics related to Immunology.</b></p> <p><b>3. Topics related to bloodstream and Cardiovascular System Infections including:</b></p> <ul style="list-style-type: none"> <li>• Infective endocarditis and Acute Rheumatic Fever</li> <li>• Enteric fever</li> <li>• Rickettsial infections</li> <li>• HIV AIDS</li> <li>• Viral Haemorrhagic Fever</li> <li>• Malaria, Leishmaniasis, Filaria</li> <li>• Systemic Mycosis</li> </ul> <p><b>4. Topics related to Gastrointestinal Infections Including:</b></p> <ul style="list-style-type: none"> <li>• Food Poisoning</li> <li>• Gastrointestinal Infections due To               <ul style="list-style-type: none"> <li>▪ Enterobacteriaceae</li> <li>▪ Intestinal Protozoan Infections</li> <li>▪ Intestinal Helminthic Infections</li> </ul> </li> </ul> <p><b>5. Topics related to Hepatobiliary Infections including:</b></p> <ul style="list-style-type: none"> <li>• Viruses causing hepatitis</li> <li>• Parasitic infections of hepatobiliary system</li> </ul> <p><b>6. Topics related to AETCOM</b></p>	<p><b>1. Topic related to skin and soft tissue infections and musculoskeletal system infections including:</b></p> <ul style="list-style-type: none"> <li>• Staphylococcal, Streptococcal and Anaerobic infections</li> <li>• Leprosy and Anthrax</li> <li>• Viral exanthems</li> <li>• Parasitic infection of skin, soft tissue and musculoskeletal system</li> <li>• Fungal infection of skin, soft tissue and musculoskeletal system</li> </ul> <p><b>2. Topics related to Respiratory Tract Infections including:</b></p> <ul style="list-style-type: none"> <li>• Bacterial pharyngitis and Pneumonia</li> <li>• Atypical Pneumonia</li> <li>• Tuberculosis and Pertussis</li> <li>• Myxovirus infections</li> <li>• Coronavirus infections including COVID-19</li> <li>• Parasitic and Fungal infection of respiratory tract</li> </ul> <p><b>3. Topics related to Central Nervous System Infection Including:</b></p> <ul style="list-style-type: none"> <li>• Bacterial Meningitis</li> <li>• Tetanus</li> <li>• Viral Meningitis</li> <li>• Viral Encephalitis</li> <li>• Parasitic and Fungal Infections of CNS</li> </ul> <p><b>4. Topics related to Urogenital tract infections including:</b></p> <ul style="list-style-type: none"> <li>• Bacterial infections of urinary tract</li> <li>• Viral, Parasitical and Fungal infections of urinary tract</li> <li>• Infective syndromes of genital tract</li> </ul>

	<p><b>5. Topics related to Zoonotic infections, Hospital Infection Control (HIC) and misc. including:</b></p> <ul style="list-style-type: none"><li>• Ocular and ear infection</li><li>• Congenital infection</li><li>• Organisms with oncogenic potential</li><li>• National Health Programmes for communicable diseases</li></ul> <p><b>6. Topics related to AETCOM</b></p>
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**Blueprinting in knowledge domain**  
**(Representative example only. Actual figures may vary with the subject and phase)**

Level	Topic A	Topic B	Topic C	Topic D	Total
Knowledge	1	2	1	1	5(20%)
Comprehension	1	1	1	2	5(20%)
Application	2	1	1	1	5(20%)
Analysis	1	1	2	2	6(24%)
Synthesis		1		1	2(8%)
Evaluation	1		1		2(8%)
Total	6(24%)	6(24%)	6(24%)	7(28%)	25(100%)

**Verbs in various levels in Knowledge domain (Bloom's taxonomy)**

<b>Knowledge</b>	Define, Describe, Draw, Find, Enumerate, Cite, Name, Identify, List, label, Match, Sequence, Write, State, Choose ,Indicate, isolate, Order, Recognize, Underline
<b>Comprehension</b>	Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise, Extrapolate, Update
<b>Application</b>	Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use
<b>Analysis</b>	Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise
<b>Synthesis</b>	Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, rewrite
<b>Evaluation</b>	Appraise, Assess, Conclude, Critic, Decide, Evaluate, judge, Justify, Predict, Prioritise, Prove, Rank

**The question part of the MCQ (item) is called STEM; correct answer is called the KEY and the rest of the options are called DISTRACTORS.**

**Steps in writing:**

1. Select the specific learning objectives which you want to test.
2. Write the stem, it should be self-explanatory and complete, avoid using terms like (NOT, EXPECT, NEVER, ALWAYS, SOMETIMES) in the stem, if the terms are being used they should be in UPPERCASE and **bold** letter.
3. Write unambiguous and unarguably the correct answer to the stem.
4. Select the most plausible alternatives and arrange them in the form of options.
5. Avoid window dressing of the stem. This means adding superfluous and unnecessary words which confuses the student.
6. Abbreviations should be avoided.
7. Options should be grammatically parallel to the key, and should be parallel and have the same relation to the stem.
8. When writing options, avoid duplications or making options all inclusive, e 1-6, 6-10 etc.
9. The options should be arranged in rank order, eg. 256, 266, 280, 290 and not 290, 266, 280, 256.
10. "All the above" and "None of the above" should be avoided as an option.

### Distribution of Marks: - Microbiology

Papers		Maximum Marks	Minimum Passing Marks
Theory (Summative Assessment) (100 +100=200 Marks)	Theory Paper I(Sample paper Attached )	100	At least 40% marks in each paper with minimum 50% in aggregate (both papers together)
	Theory paper II(Sample paper Attached )	100	
Practical *(Summative Assessment) (60 + 40= 100 Marks) 1. Practical/clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion.)  2. Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, identification of specimens, etc. is to be also assessed.	Spotting Gram Staining Acid Fast Staining Stool microscopy for ova & cyst Hospital Infection Control (Hand hygiene, PPE, BMW management) Applied Microbiology (Syndromic case based exercise)	80	50% (Practical + viva)
	Viva (oral examination should focus on the application and interpretation) (Oral examination should focus on the application and interpretation) Charts, Graphs, Photograph & Instrument etc	20	
Internal Assessment (Not added to the marks of the university examinations and should be shown separately in the grade card)	Theory	100	50% Combined in theory and practical (not less than 40% in each for eligibility for appearing for university examination)
	Practical	100	

**\*During practical examinations you are requested to use different methods of assessment tools to improve authenticity. Please refer to competency-based assessment module for UG medical education for more examples of assessment tools.**



**Formative & Internal Assessment:** - Internal assessment shall be based on day-to-day assessment. Efforts should be made to use multiple tools even for a given competency to improve validity and reliability of assessment

It shall relate to different ways in which learners participate in learning process which is day to day recorded in record book and log book in the form of :-

- a) Assignments,
- b) Preparation for seminar,
- c) Clinical case presentation,
- d) Preparation of clinical case for discussion,
- e) Clinical case study/problem solving exercise participation in project for health care in the community,
- f) Proficiency in carrying out a practical or a skill in small research project etc.

Regular periodic examination shall be conducted throughout the course as per following schedule: -

	<b>Theory Internal Assessment (Weightage in the form of marks)</b>	<b>Practical Internal Assessment (Weightage in the form of marks)</b>
First assessment test	15	10
Second assessment test	15	10
Send Up test	35	35
Class Test (best two)	10	10
Log Book	10	10
Practical record book	-	10
Attendance	5	5
Professionalism	-	10
ATCOM	10	-
<b>Total</b>	<b>100</b>	<b>100</b>



**SRI GURU RAM DAS UNIVERSITY OF HEALTH SCIENCES, SRI AMRITSAR**

Maximum Marks: 100

**MBBS 2<sup>nd</sup> Professional Examination**

Time: 3 Hours

**Subject- Microbiology(New Scheme)**

**Paper-A**

- Note:**
1. Attempt all questions. Illustrate your answer with suitable diagrams where applicable.
  2. Question No. 1 (Multiple Choice Questions (A-J)) is to be attempted on OMR Sheet in first 15 minutes of the start of exam.
  3. Question No. 2-6 are to be attempted on the main answer book. No supplementary sheet shall be provided.
  4. Students must write QP code in the space provided on OMR sheet as well as on the title page of the main answer book.

**QP Code: MBB205A**

- 1. Multiple Choice Questions (MCQs):** [10X1=10]
- A. Which of the following is the continuous cell line used in diagnostic virology:**
- a. Rhesus monkey kidney cell culture.
  - b. Human amnion cell culture.
  - c. Human embryonic lung cell culture.
  - d. Human carcinoma of cervix cell line.
- B. What is the pH of Sabraud's dextrose agar**
- a. 7.2
  - b. 8.6
  - c. 5.6
  - d. 4
- C. Ova of which intestinal parasite are typically planoconvex**
- a. H.nana
  - b. Taenia saginata
  - c. Ascaris lumbricoides
  - d. Enterobius vermicularis
- D. The drug resistance in Mycobacterium tuberculosis is due to**
- a. Mutation
  - b. Transformation
  - c. Transduction
  - d. Conjugation
- E. What is the chemical nature of an endotoxin?**
- a. Lipopolysaccharide
  - b. Protein
  - c. Lipid
  - d. None of the above
- F. Weil Felix reaction is a serological test based on?**
- a. Hetrophile antigen
  - b. Super antigen
  - c. Hapten
  - d. None of the above

**G. Direct immunofluorescence test is used for detection of?**

- a. Rabies virus antigens
- b. Syphilis antibodies
- c. Both of above
- d. None of above

**H. Which of the vaccines is given at birth?**

- a. BCG
- b. DPT
- c. MMR
- d. None of above

**I. Lens protein is an example of?**

- a. Sequestered antigen
- b. Heterophile antigen
- c. Superantigen
- d. Neoantigen

**J. Monoclonal antibodies are produced by**

- a. Western blotting
- b. Hybridoma technology
- c. Opsonization
- d. Precipitation

**2. Describe the Sterilization under following Headings:**

[2+4+4=10]

- a. Definition.
- b. Methods of sterilisation.
- c. Principle, working and validation of Hot Air oven

**3. A newly married 23 year old female is brought sick to an emergency ward. She has a fast running pulse and low blood pressure, fever and gives H/O inserting vaginal tampons from the beginning of her menstruation 5 days back. On the basis of above diagnosis, answer the following question :**

[1+4+3+2=10]

- a. What is your probable diagnosis?
- b. Discuss the etiopathogenesis of the same.
- c. Enumerate the toxins and enzymes elaborated by Staphylococcus aureus.
- d. What is a superantigen?

**4. Draw & Label / Preferably Reasoning Questions:**

[3x5=15]

- a. Explain why late lactose fermenters produce pink colonies on Macconkey's agar only after 48 hours of incubation.
- b. Explain why in diagnosis of Kala-azar, NNN medium is incubated with patient's blood at room temperature (22-24 degrees C) for 2 weeks.
- c. Explain why super carriers are highly infectious

**5. Write short notes on:**

[8 x 5=40]

- a. Demonstration of confidentiality pertaining to patient identity on laboratory results
- b. Cell cultures in virology
- c. Bacterial growth curve
- d. ELISA
- e. Type 1V hypersensitivity
- f. Laboratory diagnosis of Cholera
- g. Pathogenesis and clinical course of enteric fever
- h. Morphology of HIV

**6. Write short notes on (Applied Questions):**

[3x5=15]

- a. Sereny's test
- b. Serological markers of Hepatitis B
- c. Automated blood culture



Maximum Marks : 100

**MBBS 2<sup>nd</sup> Professional Examination**

Time : 3 Hours

**Subject- Microbiology(New Scheme)**

**Paper-B**

- Note:**
1. Attempt all questions. Illustrate your answer with suitable diagrams where applicable.
  2. Question No. 1 (Multiple Choice Questions (A-J)) is to be attempted on OMR Sheet in first 15 minutes of the start of exam.
  3. Question No. 2-6 are to be attempted on the main answer book. No supplementary sheet shall be provided.
  4. Students must write QP code in the space provided on OMR sheet as well as on the title page of the main answer book.

**QP Code: MBB206A**

**1. Multiple Choice Questions (MCQs) :** [10x1=10]

**A. 'Medusa head 'appearance of colonies is a characteristic feature of**

- a. Clostridium perfringens
- b. Mycoplasma hominis
- c. Bacillus anthracis
- d. Ureaplasma urealyticum

**B. Numerous acid-fast bacilli are seen in the lesions of:**

- a. Tuberculoid Leprosy
- b. Lepromatous Leprosy
- c. Both of the above
- d. None of the above

**C. Which of the following is an important cause of myonecrosis:**

- a. Staphylococcus aureus
- b. Clostridium perfringens
- c. Candida albicans
- d. Klebsiella pneumoniae

**D. A rose gardener presented with nodular ulcerating disease of the skin ,KOH mount revealed a yeast phase while culture at room temperature showed mycelial phase with flower like clusters of conidia. Causative organism is a dimorphic fungus probably is**

- a. Histoplasma capsulatum
- b. Sporothrix schenki
- c. Penicillium marneffi
- d. Coccidioides immitis

**E. Which of the following virus is associated with causation of Kaposi's sarcoma?**

- a. Herpes Simplex Virus
- b. Huma Herpes virus 6
- c. Huma Herpes virus 8
- d. Herpesvirus simiae

**F. Which of the following drugs is effective against Herpes Simplex Virus encephalitis?**

- a. Ziduvudine
- b. Acyclovir
- c. Amantadine
- d. Ribavirin

**G. What is not true about Naegleria fowleri?**

- a. It causes primary amoebic encephalitis
- b. It grows best at high temperature.
- c. Diagnosis can be made by demonstrating motile trophozoites in CSF
- d. It grows in salt water

**H. Eosinophilic meningitis is caused by :**

- a. Angiostrongylus sp.
- b. Baylisascaris sp.
- c. Gnathostoma sp.
- d. All of above

**I. Which of the following is true for tetanus :**

- a. Burn patients are not at risk for tetanus
- b. Tetanus cannot be controlled via herd immunity
- c. Any reaction to tetanus toxoid means further doses cannot be give
- d. Tetanus is caused by an aerobic spore bearing organism

**J. Cryptococcus neoformans can be differentiated from nonpathogenic cryptococci by:**

- a. Growth at 37 Deg C
- b. Production of brown colonies on Bird Seed Agar
- c. Urea hydrolysis
- d. All of the above

**2. Describe the Pneumonia under following headings:** [2+2+4=10]

- a. Definition
- b. Bacterial causes of Pneumonia
- c. Laboratory diagnosis of Pneumococcal Pneumonia

**3. A 16 years male child bitten by a stray dog presented in the emergency with lacerated wound on the right forearm. He was sent to a medical specialist after local first aid and a shot of tetanus toxoid injection. On the basis of above statement, answer the following questions:** [1+4+3+2=10]

- a. What is your probable diagnosis?
- b. Describe microbiological diagnostic protocol
- c. How would you give immune-prophylaxis in this case
- d. Name 2 other zoonotic diseases acquired from dogs

**4. Draw & Label /Preferably Reasoning Questions:** [3x5=15]

- a. Why early morning urine sample collected for three consecutive days is preferred over midstream urine & why acid-alcohol is used as a decolouriser during Zeihl-Neelsen staining of the sample deposit?
- b. How antigenic shift causes influenza A pandemics?
- c. Why Acanthamoeba causes severe keratitis in contact lens wearers?

**5. Write the short notes on:** [8x5=40]

- a. Pseudomembranous colitis.
- b. Spill management
- c. Bacteriological examination of water
- d. Etiopathogenesis of COVID-19
- e. Acute bacterial meningitis.
- f. Characteristic features of bacteria causing skin and soft tissue infections
- g. Leishman Staining for parasitic infections of skin
- h. Demonstration of respect for patient samples

**6. Write short notes on (Applied Questions):** [3x5=15]

- a. Nucleic Acid amplification tests for detection of organisms causing genitourinary infections.
- b. Elek's Gel pptn test .
- c. Co-agglutination test for rapid diagnosis of fungal meningitis.