# 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**: General Bacteriology, Molecular Diagnostics, General Virology, General Parasitology, General Mycology | 25 | **Musculoskeletal and Skin and soft tissue infections** : Staphylcoccal, Streptococcal and Anaerobic infections, Leprosy and Anthrax, Viral exanthems, Parasitic infection of skin, soft tissue and musculoskeletal system, Fungal infection of skin, soft tissue and musculoskeletal system | 15 |
| **Immunology** | 25 | **CNS infections**: Bacterial Meningitis, Tetanus, Viral Meningitis, Viral Encephalitis, Parasitic and Fungal Infections of CNS | 20 |
| **CVS and Blood stream infections**: Infective endocarditis and Acute Rheumatic Fever, Enteric fever, Rickettsial infections, HIV AIDS, Viral Haemorrhagic Fever, Malaria, Leishmaniasis, Filaria, Systemic Mycosis | 20 | **Respiratory tract infections**: Bacterial pharyngitis and Pneumonia, Atypical Pneumonia, Tuberculosis and Pertussis, Myxovirus infections, Coronavirus infections including COVID-19, Parasitic and Fungal infection of respiratory tract | 25 |
| **GIT**: Food Poisoning, Gastrointestinal Infections due to (Enterobacteriaceae, Intestinal Protozoan Infections, Intestinal Helminthic Infections) | 15 | **Urogenital tract infections and STD's** : Bacterial infections of urinary tract, Viral, Parasitical and Fungal infections of urinary tract, Infective syndromes of genital tract | 10 |
| **Hepatobiliary Infections**: Viruses causing hepatitis, Parasitic infections of hepatobiliary system | 10 | **Zoonotic infections, HIC and Miscellaneous**: Ocular and ear infection, Congenital infection, Organisms with oncogenic potential, National Health Programmes for communicable diseases | 25 |
| **AETCOM 2.1** | 05 | **AETCOM 2.8** | 05 |
| **Total** | **100** | **Total** | **100** |

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

## Department of Microbiology

Guidelines for question paper as per the National Medical Commission, 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 | Scenario based MCQ | **10 MCQs for Paper A**<br><br>**10 MCQs for Paper B** | 10 X 2 = 20<br><br>10 X 2 = 20 |
| 2. | Long essay question | 1. 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.<br>2. Avoid giving one liners as questions.<br>3. The question stem should be structured and marking distribution should be provided.<br>4. Use action verbs from higher domains as given in this document. | **Paper A (ONE Question)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br><br>1. Structured Question<br>**Paper B (ONE Question)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br><br>1. Structured Question | 1 X 10= 10<br><br>1X 10= 10 |

| | | | | |
|---|---|---|---|---|
| 3. | Reasoning Questions | These provide excellent opportunities for testing integration, clinical reasoning and analytic ability of the student | **Paper A (5 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br><br>**Paper B (5 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 | 5 X 3 = 15<br><br>5X3 = 15 |
| 4. | Short Notes | Questions on applied aspect | **Paper A (4 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br>Marks for each part should be indicated separately<br><br>**Paper B (4 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br>Marks for each part should be indicated separately | 4 X 5 = 20<br><br>4 X 5 = 20 |
| 5. | Explain briefly | 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'. Preferably use verbs (as per List attached) in framing questions and structure them as far as possible | **Paper A (3 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br>**Paper B (3 Questions)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1 | 3 X 5 = 15<br><br>3 X 5 = 15 |
| 6. | Short Notes | 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'. Preferably use verbs (as per List attached) in framing questions and structure them as far as possible | **Paper A (4 Questions ;3+ 1 AETCOM)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br>Marks for each part should be indicated separately<br><br>**Paper B (4 Questions; 3+ 1 AETCOM)**<br>From Core Competencies as per competency based undergraduate curriculum for the Indian Medical Graduate, VOLUME 1<br>Marks for each part should be indicated separately | 4 X 5 = 20<br><br>4 X 5 = 20 |

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

## Blueprinting in knowledge domain

| 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)

| | |
|---|---|
| **Knowledge** | Define, Describe, Draw, Find, Enumerate, Cite, Name, Identify, List, label, Match, Sequence, Write, State, Choose ,Indicate, isolate, Order, Recognize, Underline |
| **Comprehension** | Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise, Extrapolate, Update |
| **Application** | Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use |
| **Analysis** | Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise |
| **Synthesis** | Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, rewrite |
| **Evaluation** | 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 | Total Marks | Minimum Passing Marks |
|---|---|---|---|---|
| Theory (Summative Assessment)<br>(100 +100=200 Marks) | Theory Paper I(Sample paper Attached ) | 100 | 200 | At least 40% marks in each paper with minimum 50% in aggregate (both papers together)<br>50% (Practical + viva) |
| | Theory paper II(Sample paper Attached ) | 100 | | |
| Practical *(Summative Assessment)<br>(60 + 40= 100 Marks)<br>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.)<br>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<br>Gram Staining<br>Acid Fast Staining<br>Stool microscopy for ova & cyst<br>Hospital Infection Control (Hand hygiene, PPE, BMW management)<br>Applied Microbiology (Syndromic case based<br>exercise) | 80 | 100 | |
| | Viva (oral examination should focus on the application and interpretation)<br>(Oral examination should focus on the application and interpretation) Charts, Graphs, Photograph & Instrument etc | 20 | | |
| Internal Assessment<br>(Not added to the marks of the university examinations and should be shown separately in the grade card) | Theory | 100 | 200 | 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: -

| **SRI GURU RAM DAS INSTITUTE OF MEDICAL SCIENCES & RESEARCH** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DEPARTMENT OF PATHOLOGY / PHARMACOLOGY/ MICROBIOLOGY** | | | | | | | | | | | | |
| **MBBS** | **Year/phase 2nd Prof.** | | | | | | **Session --** | | | | | **Cumulative percent of Theory & Practical** |
| | | | **Formative Assessment** | | | | **Continuous Internal Assessment (Theory)** | | | | | |
| **S.No.** | **Roll No.** | **Name of Student** | **1st Theory** | **Mid-Term Theory** | **Second Theory** | **Send up** | **Assignments** | **Seminars/ Class Test** | **Attendance (Theory)** | **Total** | **Percentage Theory (Minimum cut off 40%)** | **Theory + Practical=100+100=200 (Minimum cut off 50%)** |
| | | | **10** | **15** | **10** | **30** | **15** | **15** | **05** | **100** | | |
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| 8. | | | | | | | | | | | | |

| SRI GURU RAM DAS INSTITUTE OF MEDICAL SCIENCES & RESEARCH | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPARTMENT OF PATHOLOGY / PHARMACOLOGY/ MICROBIOLOGY | | | | | | | | | | | |
| **MBBS** | **Year/phase 2nd Prof.** | | | | | | | | **Session --** | | |
| | | | **Formative Assessment** | | | **Continuous Internal Assessment (Practical)** | | | | | |
| **S.No.** | **Roll No.** | **Name of Student** | **1st Practical** | **Mid-term Practical** | **Send up** | **Log Book** | **AETCOM** | **Case Base Discussion / Viva/ Museum** | **Attendance (Practical)** | **Total** | **Percentage Practical (Minimum cut off 40%)** |
| | | | **10** | **10** | **15** | **30** | **15** | **15** | **05** | **100** | |
| 1. | | | | | | | | | | | |
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# SRI GURU RAM DAS UNIVERSITY OF HEALTH SCIENCES, SRI AMRITSAR

Maximum Marks: 100 | **MBBS 2nd Professional Examination** | Time: 3 Hours

**(Session 2026)**

**Subject- Microbiology (New Scheme)**

**Paper-A**

**Note:**
1. Attempt all questions. Illustrate your answer with suitable diagrams where applicable.
2. Question No. I (Multiple Choice Questions (1-10)) is to be attempted on OMR Sheet in first 30 minutes of the start of exam.
3. Question No. II-VI 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: MBN205A**

**Multiple Choice Questions (MCQs)**: [10X2=20]

**I.** **1. Eight employees at a local office began experiencing sudden onset of severe nausea, projectile vomiting, and abdominal cramps approximately 3 hours after eating a catered lunch that included ham sandwiches and potato salad. None of the affected individuals reported having a fever. By the next morning, most felt significantly better. Which pathogen is the most likely cause of this outbreak?**

a. Salmonella enterica
b. Listeria monocytogenes
c. Staphylococcus aureus
d. Clostridium botulinum

**2. Several guests at a summer barbecue developed high fever, abdominal pain, and bloody diarrhea roughly 3 days after eating undercooked hamburgers. One child in the group later developed decreased urine output and pallor, requiring hospitalization. Which organism and complication are most likely involved?**

a. Salmonella and Reactive Arthritis
b. E. coli O157:H7 & Haemolytic Uraemic Syndrome
c. Norovirus and Severe Dehydration
d. Clostridium perfringenes & Gas Gangrene

**3. An elderly woman presents to the emergency room with blurred vision, drooping eyelids (ptosis), and difficulty swallowing. Her family mentions she recently ate home-canned green beans. She is currently experiencing progressive muscle weakness. What is the mechanism of action for the suspected toxin?**

a. Stimulation of electrolyte secretion in the intestines
b. Inhibition of protein synthesis in host cells
c. Blocking the release of acetylcholine at neuromuscular junctions
d. Destruction of red blood cells

**4. A 30-year-old male presents with a 1-week history of fever, right upper quadrant pain, and weight loss. He returned from a trip to Southeast Asia one month ago. On examination, he has hepatomegaly and tenderness over the right liver lobe. Ultrasound reveals a 5 cm hypoechoic, solitary lesion in the right lobe of the liver? What is the most likely causative organism?**

a. Escherichia coli
b. Entamoeba histolytica
c. Staphylococcus aureus
d. Clostridium perfringens

**5. A 28-year-old nurse is pricked with a needle used on a patient known to be HBeAg positive. The nurse has been vaccinated for Hep B, but her anti HBs antibody levels are unknown. What is the most appropriate next step?**

a. Re-vaccination only
b. Administration of Hepatitis B immunoglobulin (HBIG) and check surface antibody
c. No action required
d. Initiate 6 months of antiviral therapy

**6. A 50-year-old man with a history of alcohol use presents with abdominal swelling and fatigue. A liver biopsy shows ground glass hepatocytes and portal fibrosis. What is the most likely finding regarding the etiology?**

a. Acute HAV infection
b. Chronic HBV infection
c. None of the above
d. Wilson Disease

7. **A 65-year-old male in the ICU with a central venous catheter (placed 7 days ago) develops a fever of 39°C (102.2°F) and hypotension. Blood cultures drawn from both the central line and a peripheral vein are positive for Staphylococcus aureus. Which of the following is the most appropriate next step in management?**
   a. Initiate antibiotics and keep the catheter in place for 48 hours to reassess
   b. Remove the catheter immediately and initiate systemic antibiotic therapy
   c. Treat with topical antibiotic ointment at the site and keep the catheter
   d. None of above

8. **A 70-year-old man is hospitalized with a urinary tract infection. Blood cultures grow Klebsiella pneumoniae. Sensitivity reports show the organism is resistant to ceftriaxone but susceptible to meropenem and amikacin. What is the best treatment /approach?**
   a. Continue ceftriaxone MMR
   b. Switch to Ampicillin
   c. Initiate targeted therapy with a carbapenem (e.g., meropenem)
   d. No treatment necessary if fever resolves

9. **A 25-year-old female presents to the emergency department with severe wheezing, hives, and hypotension 10 minutes after being stung by a bee. She has no prior history of allergies. What is the primary mediator responsible for this reaction?**
   a. IgG
   b. Ig A
   c. Ig E
   d. Ig M

10. **A 6-month-old infant presents with recurrent, severe infections including Pneumocystis jirovecii pneumonia and persistent oral candidiasis. Laboratory tests reveal a profound lack of T-cells and low immunoglobulin levels. What is the most likely diagnosis?**
    a. DiGeorge Syndrome
    b. Common Variable Immunodeficiency (CVID)
    c. Severe Combined Immunodeficiency (SCID)
    d. Bruton's X-linked Agammaglobulinemia

**II. Describe the Sterilization under following Headings:** [10]

a. Definition of Sterilization & Disinfection
b. Methods of sterilization
c. Principle, working and validation of Hot Air oven

**III. Reasoning Questions (Why):** [5X3=15]

a. Explain why late lactose fermenters produce pink colonies on Mac Conkey 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 deg C) for 2 weeks.
c. Explain why super carriers are highly infectious
d. Why Vancomycin injection must be given slowly over a period of 30 minutes?
e. Why Glucose Broth & Bile Broth are included in the conventional blood culture set ?

**IV. Write short notes (Applied questions) on:** [4X5=20]

a. Competitive ELISA
b. Immunology of Rh Incompatibility
c. Discuss the etiopathogenesis of the same.
d. Enumerate the toxins an enzymes elaborated by Staphylococcus aureus.

**V. Explain briefly:** [3X5=15]

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

**VI. Write short notes on:** [4X5=20]

a. laboratory results
b. Laboratory diagnosis of Cholera
c. Pathogenesis and clinical course of enteric fever
d. How does it feel being family member of a sick patient?

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

Maximum Marks: 100 | **MBBS 2nd Professional Examination** | Time: 3 Hours

**(Session 2026)**

**Subject- Microbiology (New Scheme)**

**Paper-B**

**Note:**
1. Attempt all questions. Illustrate your answer with suitable diagrams where applicable.
2. Question No. I (Multiple Choice Questions (1-10)) is to be attempted on OMR Sheet in first 30 minutes of the start of exam.
3. Question No. II-VI 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: MBN206A**

**Multiple Choice Questions (MCQs)**: [10X2=20]

**I.** **1. A 45-year-old male employee at a local tannery presents to the emergency department with a 3-day history of a painless black-centered lesion on his right forearm. He reports that the lesion began as a small pruritic papule that rapidly progressed to a blister and then developed a black, necrotic eschar, surrounded by significant edema. He has no systemic symptoms like fever or cough. What is the most likely diagnosis?**

a. Staphylococcus aureus cellulitis
b. Cutaneous anthrax
c. ORF
d. Plague

**2. A 45-year-old male presents to the dermatology clinic with multiple, symmetric, erythematous nodules and plaques on his face, earlobes, and limbs, which have been developing over the past 2 years. He reports loss of eyebrows (madarosis) and a feeling of nasal blockage. Skin sensation is diminished, but there are no clearly defined anesthetic patches. What is the most likely diagnosis?**

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

**3. A 45-year-old diabetic man presents to the emergency room with extreme pain in his right leg two days after sustaining a deep, dirty wound from a farm accident. The wound is discharging foul-smelling, brownish fluid. Physical examination reveals dark, purple, and black discolored skin, with bullae. Palpation of the affected area reveals soft tissue crepitus (gas). Gram stain of the wound drainage shows large, gram-positive rods.What is the most likely causative organism?**

a. Clostridium perfringens
b. Clostridium tetani
c. Candida albicans
d. Klebsiella pneumoniae

**4. 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. Coccidoides immitis

**5. A 31-year-old man, known to be HIV-positive with a CD4 count of 100/mm³, presents with painless, raised purple plaques on his skin, particularly on the face and oral mucosa. What is the most likely causative organism for this patient's condition?**

a. Human Papilloma Virus
b. Human Herpes virus 8
c. Herpes Simplex Virus
d. HTLV-1

**6. A 24-year-old female presents to the urgent care clinic with a 3-day history of intense pain in the vulvar area, dysuria (painful urination), and a fever of 101°F (38.3°C). Physical examination reveals multiple, clustered, small vesicles on an erythematous base on the labia minora. She has not experienced these symptoms before. What is the most likely diagnosis, and what is the best initial management?**

a. Syphilitic Chancre; Penicillin
b. Primary Herpes Genitalis; Acyclovir
c. Chancroid; Azithromycin
d. Contact Dermatitis; Topical Steroid

7. **A 12-year-old boy is brought to the emergency department with a 3-day history of severe frontal headache, high fever, vomiting, and confusion. The parents mention the child was swimming in a warm, stagnant lake five days ago. Physical examination reveals a stiff neck and lethargy. A lumbar puncture is performed. What is the most likely causative agent?**
   a. Entamoeba histolytica
   b. Naegleria fowleri
   c. Acanthamoeba spp
   d. Toxoplasma gondii

8. **A 64-year-old patient presents with classic meningitis symptoms (headache, stiff neck). Initial CSF analysis shows 80% eosinophils. A preliminary test shows a false-positive result for Neisseria meningitidis, leading to ineffective antibiotic treatment. Which of the following is a common symptom in patients with Angiostrongylus meningitis?**
   a. Sudden loss of hearing
   b. Paresthesias (tingling/numbness)
   c. Rash
   d. Extreme hypotension

9. **A 45-year-old farmer presents to the urgent care clinic with a deep, dirty puncture wound on his right foot after stepping on a rusted nail in a manure-filled field. He does not remember his last tetanus shot. What is the most appropriate tetanus prophylaxis management?**
   a. No action needed
   b. Tetanus toxoid (Td/Tdap) only
   c. Tetanus Immune Globulin (TIG) only
   d. Tetanus toxoid (Td/Tdap) + Tetanus Immune Globulin (TIG)

10. **A 43-year-old male with a newly diagnosed HIV infection (CD4 count < 100 cells/µL) presents to the emergency room with a 2-week history of worsening headache, fever, and confusion. A lumbar puncture is performed. India ink staining of the cerebrospinal fluid (CSF) reveals encapsulated budding yeast. Which of the following is the preferred initial treatment for this patient?**
   a. Fluconazole monotherapy
   b. Amphotericin B + Flucytosine
   c. Voriconazole
   d. Caspofungin

**II. Describe the acute bacterial Pneumonia under following headings:** [10]

a. Definition
b. Etiopathogenesis
c. Sample collection precautions
d. Laboratory diagnosis of Pneumococcal Pneumonia

**III. Reasoning Questions (Why):** [5X3=15]

a. Why early morning urine sample collected for three consecutive days is preferred over midstream urine & why acid-alcohol as a decolorizer during Ziehl Neelsen staining of the sample deposit?
b. How antigenic shift causes influenza A pandemic?
c. Why Acanthamoeba causes severe keratitis in contact lens wearers?
d. Why ASO testing is preferred over throat swab culture in acute Rheumatic fever?
e. Why Loeffler Serum Slope medium is preferred over blood agar for culture of Corynebacterium diphtheriae?

**IV. Write short notes (Applied questions) on:** [4X5=20]

a. Pseudomembranous colitis.
b. Spill management
c. Bacteriological examination of water
d. Acute bacterial meningitis

**V. Explain briefly:** [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.

**VI. Write short notes on:** [4X5=20]

a. Acute bacterial meningitis.
b. Characteristic features of bacteria causing skin and soft tissue infections
c. Leishman Staining for parasitic infections of skin
d. Communication skills in health care