

Question Booklet Series : A

Important: Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.

Roll No.

In Figures

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In Words

O.M.R. Answer Sheet Serial No.

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Signature of the Candidate : _____

Subject : M.Sc. (Two Year Course) Microbial Biotechnology

Time : 90 minutes

Number of Questions : 75

Maximum Marks : 75

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal gently when asked to do so.
5. Please check that this Question Booklet contains 75 questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen**.
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculator is not allowed.**

SEAL

- The organisms which use organic molecules both for energy and for carbon source are called :**
(A) Photoautotrophs (B) Chemoheterotrophs
(C) Chemoautotrophs (D) Photoheterotrophs
- Flagellar motility of bacteria is due to :**
(A) Gliding movement (B) Swimming movement
(C) Rotatory movement (D) Swarming movement
- Generation time of bacterial population is defined as the time taken to :**
(A) Reach the exponential phase (B) Double its population
(C) Reach the stationary phase (D) Move to next generation
- In solid phase radio immunoassay which of the following radioactive compound is used for determination of serum hormones ?**
(A) ^{125}I (B) P^{32}
(C) Tc^{90} (D) C^{14}
- Which of the following bacteria has been used as a biological weapon ?**
(A) *Clostridium botulinum* (B) *Bacillus anthracis*
(C) *Mycobacterium tuberculosis* (D) *Vibrio cholerae*
- Identify the causative agent for bacillary dysentery :**
(A) *Pseudomonas aeruginosa* (B) *Shigella flexneri*
(C) *Proteus vulgaris* (D) *Klebsiella pneumoniae*
- The candle jar is used to incubate organisms that require an atmosphere enriched with :**
(A) Carbon dioxide (B) Sulphur dioxide
(C) Nitrogen (D) Chlorine
- For viewing stained smear under oil immersion lens, which of the following oil is used :**
(A) Olive oil (B) Cedar wood oil
(C) Mustard oil (D) Sunflower oil
- Which of the following property of bacteria can be checked by employing hanging drop method ?**
(A) Ability to adhere (B) Ability to produce toxins
(C) Ability to fix nitrogen (D) Ability to move

10. Which of the following disease has been eradicated world wide :

- (A) *Hepatitis B* (B) *Measles*
(C) *Polio myelitis* (D) *Small pox*

11. Immune complex mediated hypersensitivity reaction is classified as :

- (A) Type-I reaction (B) Type- II reaction
(C) Type- III reaction (D) Type- IV reaction

12. VDRL test is performed for the diagnosis of :

- (A) Typhoid (B) Malaria
(C) Amoebiasis (D) Syphilis

13. A significant drop in the number of circulating CD4 T cells is seen in :

- (A) Whooping cough (B) Gonorrhoea
(C) AIDS (D) Genital Herpes

14. Liposomes are :

- (A) Structures made up of proteins
(B) Open ring structures filled with solvents
(C) Closed vesicles having single bilayer of fatty acid chains, filled with solvents
(D) Closed vesicles having single layer of fatty acid chains, filled with solvents

15. The non granulocytic leukocytes are :

- (A) Neutrophils and Eosinophils (B) Eosinophils and Basophils
(C) Neutrophils and Lymphocytes (D) Lymphocytes and Monocytes

16. A decrease in hemoglobin level below the normal range is an indication of :

- (A) Thalassemia (B) Anemia
(C) Cytopenia (D) Leukopenia

17. Wintrobe's or Westergren's tubes are used for the determination of :

- (A) Mast cell count (B) Ribosomal sedimentation rate
(C) Platelet count (D) Erythrocyte sedimentation rate

18. PCR/ Sequencing technique is used to give information about :

- (A) Identification of bacterial genera (B) Identification of bacterial genera and species
(C) Morphology of bacteria (D) Energy metabolism in bacteria

SEAL

19. **Characteristic features of normal flora are :**
- (A) Desquamation
 - (B) Adherence to host cells
 - (C) Decrease immune response
 - (D) Decrease dryness
20. **Bacteria enter stationary phase because of the reason :**
- (A) Toxic product get accumulated
 - (B) Too much crowding takes place
 - (C) Reach upper limit of multiplication
 - (D) Nutrient remain constant
21. **Encapsulated bacteria :**
- (A) Are susceptible to complement mediated lysis
 - (B) Are susceptible to killing by antibiotics
 - (C) Are more susceptible to killing by antibodies
 - (D) Are more virulent then non capsulated bacteria
22. **Water borne infections include :**
- (A) Cholera
 - (B) Urinary tract infections
 - (C) Syphilis
 - (D) Malaria
23. **Route of transmission of infection hospitals include :**
- (A) Air borne spread
 - (B) Parenteral route
 - (C) Oral route
 - (D) Vector borne
24. **Germ free animals are known as :**
- (A) Knock out animals
 - (B) Specific pathogen free animals
 - (C) Gnotobiotic animals
 - (D) Mutant animals
25. **The Oral Polio Vaccine (OPV) comprise of :**
- (A) Recombinant Vaccine
 - (B) Subunit Vaccine
 - (C) Liver attenuated Vaccine
 - (D) Killed Vaccine
26. **Innate Immune Response :**
- (A) Is antigen specific
 - (B) Can generate memory cells
 - (C) Can only be mounted by invertebrates
 - (D) Is a non specific host defense that exist prior to exposure to an antigen

27. **Negative selection is the process which induce death of cells which :**
 (A) Become cancerous (B) Recognize self antigen
 (C) Which differentiate into memory cells (D) Which proliferate as solid tumor
28. **Surface topography and three dimensional structure of a bacterium can be revealed by :**
 (A) Thin Section Electron Microscopy (B) Phase Contrast Microscopy
 (C) Scanning Electron Microscopy (D) Inverted Microscopy
29. **Which of the following statement is not correct ?**
The major point of attack of antibiotics on microorganism include :
 (A) Inhibition of cell wall synthesis (B) Inhibition of nucleic acid synthesis
 (C) Inhibition of protein synthesis (D) Inhibition of virulence factor synthesis
30. **A common feature of trans-membrane proteins is**
 (A) Alpha helical region of 20-25 hydrophobic amino acid
 (B) A structure consisting of only β sheets
 (C) Has no cytoplasmic domain
 (D) Has no intra cytoplasmic domain
31. **Mitochondrion is a cytoplasmic organelle where:**
 (A) DNA Replication occurs
 (B) Translation occurs
 (C) Protein imported from cytoplasm are deposited
 (D) Cell Respiration occurs
32. **A fungus characterized by filamentous structure is known as :**
 (A) Hyphae (B) Mushroom
 (C) Molds (D) Mycorrhiza
33. **A substance which when injected together with antigen increases antibody production is known as :**
 (A) Hapten (B) Mitogen
 (C) Adjuvant (D) Allergen
34. **Amphitrichous flagellum represents :**
 (A) A single flagellum at each end of the cell (B) Flagella on the whole surface
 (C) Tuft of polar flagella (D) A single flagella on one side

- 35. Algae is defined as :**
- (A) A eukaryotic, photosynthetic unicellular or multicellular organism
 - (B) A prokaryotic photosynthetic unicellular organism
 - (C) A eukaryotic multicellular organism
 - (D) A unicellular photosynthetic organism
- 36. Point mutations occurs as a result of :**
- (A) The substitution of one nucleotide for another
 - (B) Addition of one nucleotide in a gene
 - (C) Loss of one nucleotide in a gene
 - (D) Shifting of one nucleotide in a gene
- 37. Siderophores secreted by microbes helps in :**
- (A) Nutrient transport
 - (B) Oxygen transport
 - (C) Phosphate transport
 - (D) Iron transport
- 38. Protection against viral disease is provided by :**
- (A) Antibodies
 - (B) Steroids
 - (C) Penicillin molecules
 - (D) Interferons
- 39. Antiviral drugs inhibit :**
- (A) Production of antiviral antibodies
 - (B) Formation of viral enzymes
 - (C) Replication of viruses
 - (D) Formation of viral envelop
- 40. Toxoid is :**
- (A) The mixture of toxin and anti-toxin
 - (B) A toxin that has been treated to destroy its toxic properties
 - (C) Is the toxin that is secreted extracellularly
 - (D) Is the toxin that remains attached to the cell membrane
- 41. Which of the property is not a character of malignant cells ?**
- (A) Unregulated cell multiplication
 - (B) Relocation to a different tissue
 - (C) Spreading through blood
 - (D) Inhibition of angiogenesis
- 42. Cell mediated immune response are :**
- (A) Suppressed by corticosteroids
 - (B) Suppressed by complement
 - (C) Enhanced by depletion of B-cells
 - (D) Enhanced by depletion of T- cells

43. Which of the property is exhibited by T_H cells ?
- (A) Stimulate migration of Neutrophils (B) Stimulate division of B cells
(C) Stimulate division of macrophages (D) Are cytotoxic for other cells
44. Which of the following statement is not correct ?
- A monoclonal antibody**
- (A) Is active against multiple epitopes (B) Is produced by immortal cells
(C) Is active against single epitopes (D) Can be produced by hybridoma technology
45. Delayed type hypersensitivity is an immune response generated by :
- (A) Mast cells (B) T cells
(C) B cells (D) Macrophages
46. Which of the following statement is incorrect ?
- NK cells are:**
- (A) Non T non B cells
(B) Are defined as natural killer cells
(C) They do not proliferate in response to antigen
(D) They kill target cells by ingestion
47. Which of the following statement is incorrect ?
- MHC**
- (A) Represents Major Histocompatibility complex
(B) It codes for complement components
(C) It has MHC-I,II and III molecules
(D) It is not associated with susceptibility and resistance to different disease
48. Which of the following statement is correct ?
- hapten :**
- (A) Do not require carrier molecule to be immunogenic
(B) Homologous carrier are not employed
(C) Have large molecular weight
(D) Show carrier effect
49. Caspases are involved in the process of :
- (A) Apoptosis (B) Phagocytosis
(C) Complement activation (D) Cytokine production

50. Out of the total cellular RNA, ribosomal RNA constitute about :
- (A) 80% (B) 60%
(C) 40% (D) 90%
51. RNA polymerase :
- (A) Synthesize rRNA on a DNA template (B) Synthesize mRNA on a DNA template
(C) Synthesize tRNA on a DNA template (D) Degrade RNA
52. To test for proper pasteurization of milk, most suitable test is :
- (A) Direct microscopic test (B) Most probable number test
(C) Phosphatase test (D) Methylene blue test
53. Vinegar contains :
- (A) Butyric acid (B) Lactic acid
(C) Acetic acid (D) Citric acid
54. Which of the following is incorrect ?
For immobilized enzyme technology, enzymes can be immobilized on :
- (A) Glass beads (B) Paper
(C) Wood chips (D) Metallic beads
55. Bakers yeast, used in baking industry comprise of :
- (A) *Saccharomyces fragilis* (B) *Saccharomyces cerevisiae*
(C) *Saccharomyces rouzii* (D) *Saccharomyces lipolytica*
56. Spectrophotometer is an instrument which measures :
- (A) Deviation of light (B) Transmission of light
(C) Distraction of light (D) Emission of light
57. Reverse transcriptase is an enzyme required for :
- (A) Synthesis of a DNA molecule using RNA as template
(B) Synthesis of RNA molecule using DNA as template
(C) Synthesis of protein molecule using DNA as template
(D) Synthesis of protein molecule using RNA as template
58. Widal test is used for detection of :
- (A) Syphilis (B) Typhoid fever
(C) Whooping cough (D) Hepatitis

59. **Constitutive enzymes are :**
 (A) Always produced by cell
 (B) Produced by the cell only in response to particular substrate
 (C) Are always associated with constitution of the cell
 (D) Are always associated with breakdown of other enzymes
60. **Polyacrylamide gel electrophoresis is used for separation of :**
 (A) Antigens
 (B) DNA
 (C) Antibodies
 (D) Proteins
61. **Tertiary structure of proteins is detected by :**
 (A) X-ray diffraction
 (B) X-ray crystallography
 (C) Chromatography
 (D) Electron microscopy
62. **HPLC denotes :**
 (A) High potential liquid chromatography
 (B) High performance liquid chromatography
 (C) High polarized liquid chromatography
 (D) High polarized light crystallography
63. **Which of the statement is not true ?**
 (A) DNA is carrier of genetic material
 (B) DNA contain phosphoric acid
 (C) DNA contain adenine, guanine cytosine and thymine
 (D) DNA is homocyclic ring of carbon and nitrogen
64. **Use of cowpox virus to immunize people against small pox was first demonstrated by :**
 (A) Louis Pasteur
 (B) Edward Jenner
 (C) Robert Koch
 (D) Antony van Leeuwenhoek
65. **Which of the following is not a fermented product :**
 (A) Vinegar
 (B) Wine
 (C) Beer
 (D) Lime soda
66. **Which of the following is not a iron binding protein ?**
 (A) Transferrin
 (B) Lysozyme
 (C) Lactoferrin
 (D) Ferritin
67. **Which of the following toxin governs the activity of the enzyme adenylate cyclase ?**
 (A) Diphtheria
 (B) Botulinum
 (C) Tetanus
 (D) Cholera

68. Which of the following statement is not true ?
Vaccines are suspension of
 (A) Killed organisms (B) Sub cellular fractions of organisms
 (C) Liver attenuated organisms (D) Antibodies
69. **Hybridoma technology is used for the preparation :**
 (A) Vaccines (B) Polyclonal antibodies
 (C) Hybrid strains of mice (D) Monoclonal antibodies
70. **How many gene segments are needed to produce the variable region of the light chain of antibody molecule ?**
 (A) 2 (B) 4
 (C) 1 (D) 3
71. **Which of the following enzyme is used for ELISA ?**
 (A) Collagenase (B) Horse radish peroxidase
 (C) Coagulase (D) Cellulase
72. **Which of the following is not a delayed type hypersensitivity ?**
 (A) Lepromin (B) Tuberculin
 (C) Leishmanin (D) Streptolysin
73. **Which of the following is not used as epidemiological markers ?**
 (A) Phage typing (B) Antibiotic susceptibility
 (C) Biotyping (D) Tissue typing
74. **Which of the following disease is not transmitted by arthropods ?**
 (A) Tularemia (B) Plague
 (C) Typhus fever (D) Typhoid
75. **Common Myeloid Progenitor Cells give rise to :**
 (A) Red blood cells (B) Plasma cells
 (C) Cells of myeloid lineage (D) Myeloma cells