

Tribhuvan University  
Institute of Science and Technology  
**Central Department of Microbiology**  
Kirtipur, Kathmandu

**M.Sc. Microbiology Entrance Model Questions**

**Symbol No.:**

Full Marks: 100

**Center:**

Pass Marks: 35

**Date of Examination:**

*Candidates are required to encircle only one right answer option in the answer sheet using dotpen or pen. Please, do not use pencil. Choosing more than one answer option will be invalid.*

1. Pure cultures of bacteria were first obtained by
  - a. Robert Koch
  - b. Louis Pasteur
  - c. Paul Ehrlich
  - d. Joseph Lister
2. Who discovered transposons?
  - a. Abelson
  - b. Harvey
  - c. McClintock
  - d. Griffith
3. The first step in infection of a host bacterial cell by a bacteriophage is
  - a. Absorption
  - b. Adsorption
  - c. Penetration
  - d. Replication
4. Yeast plays an important role in the alcohol industry, converting pyruvic acid into carbon dioxide and ethyl alcohol by the process of
  - a. Glycolysis
  - b. Respiration
  - c. Fermentation
  - d. Krebs cycle
5. The transfer of bacterial DNA to other bacteria via bacteriophages is known as
  - a. Conjugation
  - b. Transduction
  - c. Transformation
  - d. Translation
6. Which of the following does not kill endospores?
  - a. Autoclave
  - b. Pasteurization
  - c. Incineration
  - d. Hot air sterilization
7. The term obligate anaerobe refers to an organism that
  - a. Doesn't use oxygen but tolerates it
  - b. Is killed by oxygen
  - c. Uses oxygen when present or grows without oxygen when oxygen is absent
  - d. Prefers to grow without oxygen
8. In the exponential growth phase, the cells and cell mass
  - a. First increases then decreases
  - b. Decreases
  - c. Are constant
  - d. Double at a constant rate

9. Which of the following structure is present in prokaryotic cells?
- Mitochondria
  - Chloroplasts
  - Golgi structure
  - Mesosome
10. The cell walls of many gram positive bacteria can be destroyed by the enzyme
- Lysozyme
  - Lipase
  - Pectinase
  - Peroxidase
11. When acetate is the sole source of carbon for some microorganisms, the cycle which is used, is called
- Pentose phosphate pathway
  - Glycolytic pathway
  - Glyoxylate pathway
  - Oxaloacetate pathway
12. A bacterial cell that is able to take up naked DNA is known as
- Complementary
  - Liable
  - Infected
  - Competent
13. Which one of the following microscopic techniques provides three- dimensional images of a bacterial cell?
- Dark field microscopy
  - Fluorescent microscopy
  - Scanning electron microscopy
  - Transmission electron microscopy
14. The period between inoculation of bacteria in a culture medium and beginning of multiplication is known as
- Lag phase
  - Log phase
  - Stationary phase
  - Decline phase
15. All of the following are gram positive anaerobic bacteria except
- Clostridium*
  - Peptostreptococcus*
  - Propionibacterium*
  - Bacteriodes*
16. Which one of the following is not an endospore forming bacteria?
- Bacillus*
  - Clostridium*
  - Desulfotomaculum*
  - Streptococcus*
17. Buffer solutions
- Will always have a pH of 7
  - Are rarely found in living systems
  - Cause a decrease in pH when acids are added to them
  - Tend to maintain a relatively constant pH
18. What is the end product of anaerobic glycolysis?
- Acetyl-CoA
  - Pyruvate
  - Lactate
  - Acetyl carnitine
19. Which is the lightest of the following amino acids?
- Phenylalanine
  - Glycine
  - Tyrosine
  - Histidine
20. The sequence of letters 'WYNQ' will represent
- Tryptophan, tyrosine, asparagine, glutamic acid
  - Tryptophan, tyrosine, asparagine, glutamine
  - Tryptophan, glutamine, tryptophan, asparagine
  - Glutamine, tyrosine, tryptophan, aspartic acid

21. Which of the following is semi-essential amino acid?
- Tryptophan
  - Methionine
  - Lysine
  - Arginine
22. Which pyrimidine base contains an amino group at carbon 4?
- Cytosine
  - Thymine
  - Uracil
  - Adenine
23. Humans are unable to digest
- Starch
  - Complex carbohydrates
  - Denatured proteins
  - Cellulose
24. Arachidonate has 20 carbon atoms with
- 3 double bonds
  - 2 double bonds
  - 4 double bonds
  - 8 double bonds
25. In eukaryotes fatty acid breakdown occurs in
- Mitochondrial matrix
  - Cytosol
  - Cell membrane
  - Endoplasmic reticulum
26. How many molecules of ATPs are synthesized per FADH<sub>2</sub> oxidation?
- 2
  - 1
  - 3
  - 4
27. Which one is the heaviest particulate component of the cell?
- Nucleus
  - Mitochondria
  - Cytosol
  - Golgi bodies
28. The most important epimer of glucose is
- Fructose
  - Galactose
  - Arabinose
  - Xylose
29. What is the basis for the difference in how leading strand and lagging strand of DNA molecules are synthesized?
- Helicases and single-strand binding proteins work at the 5' end.
  - DNA polymerase can join new nucleotides only to the 3' end of a growing strand.
  - DNA ligase works only in the 3' to 5' direction.
  - Polymerase can work on only one strand at a time.
30. Which of the following mutations would most likely have a harmful effect on an organism?
- Deletion of three nucleotides near the middle of a gene.
  - Single nucleotide deletion near the end of the coding sequence.
  - Single nucleotide insertion downstream of, and close to the start of the coding sequence.
  - Base-pair substitution.
31. Degeneration of a genetic code is attributed to the
- First nucleotide base of codon
  - Second nucleotide base of codon
  - Third nucleotide base of codon
  - Entire nucleotide base of codon
32. The nucleic acid of T2 bacteriophage is
- dsDNA
  - ssDNA
  - dsRNA
  - ssRNA

33. At which site on DNA does a repressor binds?  
 a. Promoter  
 b. Operator  
 c. Activator  
 d. CAP site
34. The plasmid vector with an ability to transfer between two different host species is known as  
 a. Expression vector  
 b. Cosmid  
 c. Cloning vector  
 d. Shuttle vector
35. Which of the following mutagen can cause DNA strand breaks?  
 a. Alkylating agents  
 b. Intercalating agents  
 c. Ionizing radiation  
 d. Ultraviolet light
36. Which of the following would most likely be useful for increasing the amount of DNA?  
 a. RFLP  
 b. Southern blotting  
 c. Polymerase chain reaction  
 d. DNA hybridization
37. The product synthesized from mRNA using reverse transcriptase is known as  
 a. cDNA  
 b. siRNA  
 c. microRNA  
 d. Satellite DNA
38. Amino acid binding site in t-RNA is  
 a. 5' end  
 b. CCA 3' end  
 c. Anticodon loop  
 d. DHU loop
39. Transcription is terminated by which of the following factor?  
 a. Alpha  
 b. Beta  
 c. Sigma  
 d. Rho
40. DNA strand are antiparallel because of  
 a. Phosphodiester bonds  
 b. Hydrogen bonds  
 c. Glycosidic bonds  
 d. Disulphide bonds
41. Which soil is more favourable for biological activity?  
 a. Clay soil  
 b. Slit soil  
 c. Slity clay soil  
 d. Loam soil
42. The bacterial species are indigenous in soil except  
 a. *Lactobacillus*  
 b. *Agrobacterium*  
 c. *Arthrobacter*  
 d. *Pseudomonas*
43. Anaerobic decomposition of organic matter during methanogenesis yields organic acids except  
 a. Acetic acid  
 b. Pyruvic acid  
 c. Butyric acid  
 d. Formic acid
44. All are free living nitrogen fixers except  
 a. *Clostridium*  
 b. *Azotobacter*  
 c. *Azospirillum*  
 d. *Bacillus polymxa*
45. Which is the main source of biofertilizer?  
 a. *Bacillus*  
 b. *Cyanobacteria*  
 c. *Streptococcus*  
 d. *Pseudomonas*

46. The microbial ecosystem of soil includes
- a. Biotic components of soil
  - b. Abiotic components of soil
  - c. Biotic and abiotic components of soil
  - d. Soil inhabitants
47. Which of the following soil microorganism is involved in the reduction of sulfates to H<sub>2</sub>S?
- a. *Thiobacillus thiooxidans*
  - b. *Rhodospirillum*
  - c. *Rhodomicrobium*
  - d. *Desulfotomaculum*
48. The most bottom layer of Winogradsky column consists of
- a. Green sulfur bacteria
  - b. Purple non-sulfur photoheterotrophs
  - c. Sulfate reducers
  - d. Purple sulfur bacteria
49. The following of *Bacillus thuringiensis* has the most insecticidal activity
- a. Parasporal bodies
  - b. Exotoxins
  - c. Endotoxins
  - d. Endospores
50. Bud forming bacteria in soil is
- a. *Hyphomicrobium*
  - b. *Caulobacter*
  - c. *Clostridium*
  - d. *Bacillus*
51. The heavy chain of IgD is referred to as
- a.  $\mu$
  - b.  $\epsilon$
  - c.  $\alpha$
  - d.  $\delta$
52. The acute phase protein angiotensin is related to
- a. Coagulation
  - b. Cell attachment
  - c. Blood pressure
  - d. Transport
53. The following complement protein act as an opsonin
- a. C3b
  - b. C5a
  - c. C5b
  - d. C4b
54. Type III hypersensitivity is
- a. Anaphylactic hypersensitivity
  - b. Cytotoxic hypersensitivity
  - c. Immune complex hypersensitivity
  - d. Cell mediated hypersensitivity
55. Neonatal immunity is provided by
- a. IgA
  - b. IgD
  - c. IgE
  - d. IgM
56. IFN- $\beta$  is produced by
- a. Mononuclear cells
  - b. Fibroblasts
  - c. T-cells
  - d. B-cells
57. Which of the statement doesn't apply to IgG?
- a. Appears early in the primary immune response
  - b. Neutralizes bacterial toxins
  - c. Crosses the human placenta
  - d. Can fix complement

58. Antigens with high antigenicity and immunogenicity are
- Lipids
  - Proteins
  - Carbohydrates
  - Nucleic acids
59. The patients are often immune to diseases like chicken pox once infected. This immunity is an example of
- Artificially acquired active immunity
  - Naturally acquired passive immunity
  - Naturally acquired active immunity
  - Artificially acquired passive immunity
60. The following methods of diagnosis utilize labeled antibodies except?
- ELISA
  - RIA
  - Immunofluorescence
  - Haemagglutination inhibition test
61. Which of the following is not an extrinsic parameter of food?
- Temperature of storage
  - Relative humidity of environment
  - Oxidation-reduction potential
  - Controlled atmosphere
62. Temperature necessary to kill a given number of microorganisms in a fixed time, usually 10 minutes is known as
- D-value
  - Thermal death point
  - Z-value
  - F-value
63. Katsuo-bushi is a fermented fish product of Japan produced by using
- Aspergillus glaucus*
  - Aspergillus oryzae*
  - Lactobacillus cellobiosus*
  - Saccharomyces fibuligera*
64. Milk is a complete food containing all of the following nutrients except
- Riboflavin
  - Lactose
  - Casein
  - Starch
65. Test used to evaluate completion of pasteurization of milk is
- Resazurin test
  - Phosphatase test
  - MBRT test
  - Direct microscopic count
66. Which of the following is food borne intoxication?
- Salmonellosis
  - Shigellosis
  - Botulism
  - Listeriosis
67. Any point or procedure in a food system where one can minimize a hazard but not ensure control over hazard is known as
- CCP<sub>2</sub>
  - CCP<sub>1</sub>
  - Critical limit
  - Deviation
68. Typical levels of radiations used for Radappertization in food preservation is
- 0.75 to 2.5 KGy
  - 2.5 to 10 KGy
  - 10 to 15 KGy
  - 30 to 40 KGy
69. All of the following are yeast commonly found in raw or processed food except
- Saccharomyces*
  - Vagnococcus*
  - Debaryomyces*
  - Torula*

70. Microorganism which is not used as an indicator of faecal contamination of water is
- |                                   |                                  |
|-----------------------------------|----------------------------------|
| a. <i>Escherichia coli</i>        | c. <i>Streptococcus faecalis</i> |
| b. <i>Clostridium perfringens</i> | d. <i>Micrococcus</i>            |
71. Winkler's Iodometric titration method is used for the determination of
- |                              |                                   |
|------------------------------|-----------------------------------|
| a. Dissolved oxygen of water | c. Phosphate content of water     |
| b. Chemical oxygen demand    | d. Nitrate concentration of water |
72. All of the following are used to monitor microbial air pollution except
- |                        |                      |
|------------------------|----------------------|
| a. Impingement method  | c. Filtration method |
| b. Microkjeldal method | d. Impaction method  |
73. Biological treatment of waste water involves following techniques except
- |                     |                                    |
|---------------------|------------------------------------|
| a. Trickle filter   | c. Ammonia stripping               |
| b. Activated sludge | d. Rotating Biological Disc method |
74. A bacterium extensively used for bioleaching of valuable metals from acid mine drainage is
- |                                     |  |
|-------------------------------------|--|
| a. <i>Zooglea ramigera</i>          | c. <i>Bacillus strearothermophilus</i> |
| b. <i>Thiobacillus ferrooxidans</i> | d. <i>Clostridium butyricum</i>        |
75. Nitrite reductase is an important enzyme involved in denitrification process of nitrogen cycle whose synthesis is inhibited by
- |            |            |
|------------|------------|
| a. Nitrate | c. Ammonia |
| b. Oxygen  | d. Nitrite |
76. *Gluconobacter* when provided with the ethyl alcohol as electron donor, oxidizes the ethyl alcohol via.
- |                 |                |
|-----------------|----------------|
| a. Quinones     | c. Acetic acid |
| b. Acetaldehyde | d. Cytochromes |
77. Which one of the following is not an acid fast?
- |                                      |                       |
|--------------------------------------|-----------------------|
| a. <i>Mycobacterium tuberculosis</i> | c. <i>Nocardia</i>    |
| b. <i>Mycobacterium leprae</i>       | d. <i>Actinomyces</i> |
78. Which one of the following statement is true?
- |   |   |
|---|---|
| a. Slide coagulase test detects bound coagulase | c. Tube coagulase test detects bound coagulase  |
| b. Slide coagulase test detects free coagulase  | d. Tube coagulase test doesn't detect coagulase |
79. *Streptococcus pyogenes* can be differentiated from other haemolytic streptococci on the basis of
- |                                |                           |
|--------------------------------|---------------------------|
| a. Erythromycin sensitivity    | c. Bacitracin sensitivity |
| b. Aminoglycosides sensitivity | d. Penicillin sensitivity |
80. On MacConkey agar, colonies of *E. coli* are
- |                           |                |
|---------------------------|----------------|
| a. Lactose fermenting     | c. Haemolytic  |
| b. Lactose non-fermenting | d. Pale yellow |
81. Which enrichment media do you select for stool samples that have been received in your laboratory from an outbreak of *Salmonella* gastroenteritis in a community?
- |                      |                         |
|----------------------|-------------------------|
| a. Cary Blair medium | c. MRVP broth           |
| b. Selenite F broth  | d. Thioglycolate medium |

82. Which one of the following is not true about *Shigella*?
- Four different species
  - Presence of peritrichous flagella
  - Causes bacillary dysentery
  - Transmitted by faecal oral route
83. *Neisseria meningitidis* is
- Catalase positive, oxidase positive and non-capsulated
  - Catalase positive, oxidase negative and capsulated
  - Catalase positive, oxidase positive and capsulated
  - Catalase negative, oxidase negative and capsulated
84. *Corynebacterium diphtheriae* is also known as
- Hansen's bacillus
  - Koch's bacillus
  - Anthrax bacillus
  - Klebs-Löffler bacillus
85. The vector of Zika virus is
- Aedes aegypti*
  - Culiseta incidens*
  - Culex nigripalpus*
  - Anopheles quadrimaculatus*
86. Which is the causative agent of smallpox?
- Vaccinia virus
  - Monkey pox
  - Variola virus
  - Chicken pox
87. Which of the following viruses are associated with gastroenteritis?
- Rubella virus
  - Rabies virus
  - Rhino virus
  - Rota virus
88. Which of the following virus has partially double stranded DNA?
- Hepatitis A
  - Hepatitis B
  - Hepatitis C
  - Hepatitis D
89. Fungi that infects outside layers of skin or hair or nail only are classified as
- Superficial
  - Cutaneous
  - Subcutaneous
  - Subsuperficial
90. Which of the following is known as rose handler's disease?
- Cryptococcosis
  - Histoplasmosis
  - Sporotrichosis
  - Tinea cruris
91. Which of the following is not dimorphic and is the only medically important encapsulated yeast?
- Histoplasma capsulatum*
  - Cryptococcus neoformans*
  - Coccidioides immitis*
  - Sporothrix schenckii*
92. Aspergillosis is recognized in tissue by the presence of
- Septate hyphae
  - Pseudo hyphae
  - Metachromatic granules
  - Budding yeast cells
93. *Leishmania* is cultured in which one of the following media
- Chocolate agar
  - Tellurite
  - NNN media
  - Sabouraud
94. Cerebral malaria is caused by
- P. falciparum*
  - P. vivax*
  - P. malariae*
  - P. ovale*



95. Cysts consisting of 1-8 nuclei is the characteristics of
- |                                 |                               |
|---------------------------------|-------------------------------|
| a. <i>Entamoeba histolytica</i> | c. <i>Entamoeba hartmanni</i> |
| b. <i>Entamoeba dispar</i>      | d. <i>Entamoeba coli</i>      |
96. Trophozoite of *Giardia lamblia* has the characteristics of the following except
- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| a. Four nuclei grouped at one end | c. Has a large concave sucking disc |
| b. Small pear shaped flagellate   | d. Has four pairs of flagella       |
97. The following protozoan parasite is ciliate
- |                                 |                                 |
|---------------------------------|---------------------------------|
| a. <i>Entamoeba histolytica</i> | c. <i>Trichomonas vaginalis</i> |
| b. <i>Giardia lamblia</i>       | d. <i>Balantidium coli</i>      |
98. HRP2 antigen is used in the rapid diagnosis of
- |                           |                          |
|---------------------------|--------------------------|
| a. Visceral leishmaniasis | c. Japanese encephalitis |
| b. Malaria                | d. Dengue                |
99. Chyluria is the complication of
- |  |                                   |
|--|-----------------------------------|
| a. <i>Wuchereria bancrofti</i> infection | c. <i>Brugia timori</i> infection |
| b. <i>Brugia malayi</i> infection        | d. <i>Loa Loa</i> infection       |
100. Bacteria are more sensitive to antibiotics at which phase of growth curve?
- |              |                     |
|--------------|---------------------|
| a. Lag phase | c. Stationary phase |
| b. Log phase | d. Decline phase    |

**BEST OF LUCK**