

Seat No.

P.G. Entrance Examination
M.Sc. Microbiology
Sub. Code: 58717

Day and Date : Thursday, 14-May-2026
Time : 01.00 pm to 02.30 pm

Total Marks : 100

Instructions:

- 1) All questions are compulsory
 - 2) Each question carries 1 mark
-

1. disproves the theory of spontaneous generation by using famous "swan-neck flask" experiment.

A) Francesco Redi

B) John Tyndall

C) Lazzaro Spallanzani

D) Louis Pasteur

2. The main difference between prions and virus is

A) Prions are larger than viruses

B) Prions lack genetic material

C) Prions have a lipid bilayer

D) Prions only infect bacteria

3. is not a cellular microorganism.

A) Bacteria
B) Virus
C) Algae
D) Fungi

4. Which of the following statement about eukaryotic vs. prokaryotic cells is true?
- A) Eukaryotic cells are smaller than prokaryotes
 - B) Prokaryotes have a true nucleus
 - C) Eukaryotic cells have complex membrane-bound organelles.
 - D) Both have 80S ribosomes
5. system is located closest to the specimen.
- A) Ocular lens
 - B) Condenser lens
 - C) Objective lens
 - D) Eyepiece
6. is a method of Pasteurization involving heating at 72°C for 15 seconds.
- A) LTLT
 - B) HTST
 - C) UHT
 - D) Tyndallization
7. The Bead-bubbler device is an example of type of air sampling method.
- A) Liquid Impingement
 - B) Solid Impaction
 - C) Gravitational Sedimentation
 - D) Membrane Filtration

8. Obligate anaerobes are killed by oxygen because they lack enzymes.
- A) Amylase and Lipase
 - B) Superoxide dismutase and Catalase
 - C) Protease and Polymerase
 - D) Lactase and Isomerase
9. MacConkey agar is both selective and differential medium used specifically for the cultivation of bacteria
- A) Gram-positive
 - B) Acid-fast
 - C) Anaerobic
 - D) Gram-negative
10. The statistical estimate of the MPN test is usually expressed as the number of organisms per
- A) 1 mL
 - B) 10 mL.
 - C) 100 mL
 - D) 1000 mL
11. The temperature change required to change the decimal reduction time by one log cycle is.....
- A) D-value
 - B) Z-value
 - C) TDT
 - D) F-value
12. Glucose effect is the regulatory mechanism most closely associated with
- A) Synchronous growth
 - B) Binary fission
 - C) Diauxic growth
 - D) Stationary phase

31. act as a bridge between innate and adaptive immunity by presenting antigens to T-helper cells.
- A) Erythrocytes
 - B) Macrophages
 - C) Platelets
 - D) Mast cells
32. is often referred to as the "graveyard" of red blood cells and also filters blood-borne pathogens.
- A) Liver
 - B) Spleen
 - C) Kidney
 - D) Lymph node
33. is the main outcome of the interaction between an APC and a naive T_H cell.
- A) Immediate apoptosis
 - B) Differentiation into cytotoxic T cells
 - C) Proliferation and differentiation of cells
 - D) Direct killing of the APC
34. Exogenous antigens are processed in endosomes and presented on
- A) MHC Class I
 - B) MHC Class II
 - C) TAP-I
 - D) Cytosol

35. Complement binds to of the antibody.
- A) Fc portion
 - B) Heavy chain
 - C) Hinge region
 - D) Fab region
36. developed the hybridoma technology for the production of monoclonal antibodies
- A) Watson and Crick
 - B) Kohler and Milstein
 - C) Robert Koch
 - D) Alexander Fleming
37. Most cytokines act over short distances and affect cells in their immediate vicinity. This mode of action is called
- A) Endocrine
 - B) Autocrine
 - C) Paracrine
 - D) Exocrine
38. Serum sickness is an example of
- A) Type I hypersensitivity
 - B) Type II hypersensitivity
 - C) Type III hypersensitivity
 - D) Type IV hypersensitivity

39. Rheumatoid arthritis is primarily classified as type of
- A) Degenerative disease
 - B) Metabolic disease
 - C) Autoimmune disease
 - D) Infective disease
40. is considered the main mechanism of central self-tolerance.
- A) Clonal expansion
 - B) Clonal deletion
 - C) Antibody-dependent cellular cytotoxicity
 - D) Passive immunity
41. is the most common carbon source used in the production of industrial alcohol.
- A) Cellulose
 - B) Molasses
 - C) Starch
 - D) Lignin
42. are live bacteria that, when ingested in sufficient quantities, offer health advantages.
- A) Antibodies
 - B) Antibiotics
 - C) Probiotics
 - D) Preservatives
43. are responsible for the ropiness in wine.
- A) Yeasts
 - B) Bacteria
 - C) Viruses
 - D) Algae

44. is the intrinsic factor most directly connected to the availability of free water for microbial metabolism.
- A) pH
 - B) oxidation-reduction potential
 - C) water activity
 - D) nutrient content
45. organisms is widely used for the industrial production of lysine through strain improvement.
- A) *Bacillus subtilis*
 - B) *Corynebacterium glutamicum*
 - C) *Escherichia coli*
 - D) *Saccharomyces cerevisiae*
46. is the primary intermediate used for the production of most semi-synthetic penicillins.
- A) Benzylpenicillin
 - B) 6-aminopenicillanic acid (6-APA)
 - C) 7-aminocephalosporanic acid
 - D) Penicilloic acid
47. The Staphylococcal enterotoxin serotype is most commonly associated with food poisoning outbreaks.
- A) type B
 - B) type A
 - C) type C
 - D) type D

53. is most commonly recognized as a potent phosphate solubilizing bacterium.
- A) Rhizobium sp.
 - B) Azotobacter sp.
 - C) Pseudomonas sp.
 - D) Nitrosomonas sp.
54. is NOT used as a biopesticide.
- A) Bacillus thuringiensis
 - B) Trichoderma harzianum
 - C) Nucleopolyhedrovirus (NPV)
 - D) Xanthomonas campestris
55. Phosphate solubilizing microorganisms solubilize P by
- A) Nitrogen fixation
 - B) Organic acid production
 - C) Protein synthesis
 - D) Methane production
56. are primarily responsible for converting nitrites into nitrates.
- A) Nitrosomonas sp.
 - B) Nitrobacter sp.
 - C) Rhizobium sp.
 - D) Azotobacter sp.

62. enzyme is used to add homopolymer tails to blunt-ended DNA molecule.
- A) Polynucleotide kinase
 - B) Terminal transferase.
 - C) Alkaline phosphatase
 - D) Reverse transcriptase
63. In prokaryotes, consensus sequence of Pribnow box is
- A) TATAAT
 - B) GACATA
 - C) CACAAC
 - D) GAGAAG
64. The production of wild-type phenotype by combining two genomes carrying mutation in a diploid is called
- A) Suppression
 - B) Complementation
 - C) Transformation
 - D) Electroporation
65. Environmental conditions under which a conditional mutation shows the wild-type phenotype is called
- A) Permissive
 - B) Non-permissive
 - C) Optimum
 - D) Sensitive
66. is a phenomenon in which all genes distal to the mutation in an operon are not translated.
- A) Complementation
 - B) Polarity
 - C) Phenotypic lag
 - D) Restriction

72. model explains stepwise conformational changes in an allosteric enzyme subunits during catalysis
- A) Lock-and-key model B) Induced fit model
- C) Sequential model D) Concerted model
73. The process of homogenization carried out during enzyme extraction is primarily used for
- A) Separation of cellular components
- B) Preservation of enzyme activity
- C) Purification based on solubility
- D) Disruption of cells to release intracellular enzymes
74. In a substrate-based enzyme assay, enzyme activity is determined by measuring
- A) Decrease in substrate concentration
- B) Decrease in product formation
- C) Change in enzyme structure
- D) Increase in reaction temperature
75. Isozymes are best defined as enzymes that
- A) Catalyze different reactions with identical structure
- B) Differ in structure but catalyze the same reaction
- C) have identical structure and function
- D) Are inactive under physiological conditions

76. Proximity and orientation effect enhances enzyme catalysis by
- A) Formation of a covalent enzyme-substrate intermediate
 - B) Proper alignment of reactive groups at the active site
 - C) Proton transfer between enzyme and substrate
 - D) Inducing strain in the substrate
77. The Michaelis-Menten equation describes the relationship between enzyme reaction velocity and
- A) Enzyme concentration
 - B) Product concentration
 - C) Substrate concentration
 - D) Cofactor concentration
78. The pentose phosphate pathway primarily functions to produce
- A) ATP and pyruvate
 - B) NADPH and ribose-5-phosphate
 - C) Lactate and ATP
 - D) CO₂ and ATP
79. is not required for RNA synthesis
- A) DNA template
 - B) RNA polymerase
 - C) Ribonucleotides
 - D) Primer

80. Catabolite repression in bacteria occurs when glucose availability leads to
- A) Decreased CAMP levels and reducing transcription of alternative metabolic genes
 - B) Increased CAMP levels and activation of alternative pathways
 - C) Activation of repressor proteins independent of glucose
 - D) Direct inhibition of enzyme catalytic activity
81. Aerators are used in..... biological treatment methods.
- A) aerobic
 - B) anaerobic
 - C) chlorination
 - D) ozonation
82. When the sewage is discharged into the water, it results in
- A) bioremediation
 - B) eutrophication
 - C) increase in oxygen.
 - D) biosparging
83. is used as an oxidizing agent in COD determination of sewage.
- A) CaSO_4
 - B) MnSO_4
 - C) $\text{K}_2\text{Cr}_2\text{O}_7$
 - D) KH_2PO_4
84. is the waste generated by distillery industry.
- A) Whey
 - B) Bagasse
 - C) Dairy
 - D) Spent wash
85. species is most commonly used in copper bioleaching.
- A) Salmonella
 - B) Pseudomonas
 - C) Thiobacillus
 - D) Lactobacillus

ROUGH WORK