

Seat No.

Total No. of Pages : 20

P.G. Entrance Examination 2025
Biochemistry/Biotechnology/Medical Information Management
Subject Code : 58725

Day and Date : Tuesday,13-May-2025**Total Marks : 100****Time : 03.30 pm to 05.00 pm**

Instructions:

- 1) All questions are compulsory.
 - 2) Each question carries 1 mark.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Follow the instructions given on OMR sheet.
 - 5) Rough work shall be done on the sheet provided at the end of question paper.
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1. Which of the following makes water a liquid at room temperature?
 - a) Noncovalent interactions
 - b) Hydrogen bonds between water molecules
 - c) Van der Waals forces of attraction.
 - d) Covalent bonding
2. The amino acid sequences of thousands of different proteins from many species have been determined using principles first developed by?
 - a) Watson and Crick
 - b) Edman
 - c) Sanger
 - d) Mendel

3. Which of the following is a function of chaperone protein?
- a) It provides a template for how the proteins should fold
 - b) It degrades proteins that have folded properly
 - c) It degrades proteins that have folded improperly
 - d) It rescues proteins that have folded improperly and allowed them to refold properly
4. Which of the following is true about phosphodiester linkage?
- a) 3'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
 - b) 3'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide
 - c) 5'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide
 - d) 5'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
5. Which of the following is true about t_m ?
- a) The higher the content of $G \equiv C$ base pairs, the lower the t_m
 - b) The higher the content of $A = T$ base pairs, the higher the t_m
 - c) It can be termed as renaturation temperature
 - d) The higher the content of $G \equiv C$ base pairs, the higher the t_m
6. The number of milligrams of KOH required to neutralize the free and combined fatty acid in one gram of a given fat is called
- a) Polenske number
 - b) Acid number
 - c) Saponification number
 - d) Iodine number

7. Which of the following is a choline-containing lipid?
- a) Phosphatidylethanolamine
 - b) Phosphatidylserine
 - c) Sphingomyelin
 - d) Phosphatidylglycerol
8. Which of the following occurs in meiosis but not in mitosis?
- a) Pairing of homologous chromosomes at metaphase plate.
 - b) Separation of sister chromatids at anaphase
 - c) Attachment of spindle fibers to kinetochore
 - d) Replication of DNA prior to start of cell division
9. Migration of cancerous cells from the site of origin to other part of the body forming secondary tumors is called.....
- a) Proliferation
 - b) Diapedesis
 - c) Apoptosis
 - d) Metastasis
10. Which of the following is the study of energy relationships and conversions in biological systems?
- a) Biochemistry
 - b) Biophysics
 - c) Biotechnology
 - d) Bioenergetics
11. Which of the following is not an important precursor of glucose in animals?
- a) Pyruvate
 - b) Glucose 6-phosphate
 - c) Lactate
 - d) Glycerol

12. Which of the following are exclusively glucogenic?
- a) Lysine
 - b) Leucine
 - c) Threonine
 - d) Arginine
13. Which effects the increased levels of hydrogen ions in the inter-membrane space of the mitochondria?
- a) Decreased levels of chemiosmosis
 - b) Increased levels of water in inter-membrane space
 - c) Increase ATP production
 - d) Decreased levels of oxidative phosphorylation
14. Which of the following plays a substantial role in linking together sister chromatids immediately after replication?
- a) Topoisomerases
 - b) Histones
 - c) Condensins
 - d) Cohesins
15. Which of the following is an example of RNA-dependent DNA polymerase?
- a) RNA polymerase II
 - b) DNA ligase
 - c) Reverse transcriptase
 - d) RNA polymerase I
16. Which of the following is not a step involved in gel filtration?
- a) Gel preparation
 - b) Precipitation
 - c) Sample application
 - d) Elution of the sample

17. The polymerase chain reaction is used for.
- a) Amplifying gene of interest
 - b) Constructing RAPD maps
 - c) Detecting the presence of the transgene in an organism
 - d) All of the above
18. Based on which of the following enzymes Hydrolysis reactions are catalyzed?
- a) Hydrolase
 - b) Oxidoreductase
 - c) Isomerase
 - d) Ligase
19. Which of the following is an imino acid?
- a) Serine
 - b) Alanine
 - c) Glycine
 - d) Proline
20. Which of the following is an example of epimers?
- a) Mannose & Glucose
 - b) Glucose & Ribose
 - c) Galactose & Mannose
 - d) Glucose & Galactose
21. The phenolphthalein indicator turns in alkaline medium.
- a) yellow
 - b) colorless
 - c) pink
 - d) blue
22. The paper chromatography technique based on.....
- a) adsorption
 - b) partition
 - c) absorption
 - d) size

29. Which of the following is a colligative property?
- a) Relative lowering of fluid pressure
 - c) Decrease in freezing point
 - b) Decrease in boiling point
 - d) Change in volume after mixing
30. A pair of solution bears the same osmotic pressure. What is this pair of solutions called?
- a) Hypertonic
 - c) Isotonic
 - b) Hypotonic
 - d) Osmolarity
31. Which of the following solutions cannot conduct electricity?
- a) Sugar in water
 - c) MgCl_2 in water
 - b) NaCl in water
 - d) KCl in water
32. Which of the following will lead to an increase in the rate of the reaction?
- a) Decrease in temperature
 - c) Addition of catalyst
 - b) Decreasing concentration of reactants
 - d) Addition of inhibitor
33. Which of the following colloidal system represents a gel?
- a) Solid in liquid
 - c) Liquid in solid
 - b) Solid in gas
 - d) Liquid in gas

40. The respiratory chain of bacteria is associated with the.....
- a) cytoplasmic membrane
 - b) cell wall
 - c) cytoplasm
 - d) mitochondrial membrane
41. Growth of bacteria or microorganisms refer to.....
- a) changes in the total population
 - b) an increase in number of cells
 - c) an increase in the size of an individual organism
 - d) an increase in the mass of an individual organism
42. Which of the following method can be used to determine the number of bacteria quantitatively?
- a) Spread-plate
 - b) Streak-plate
 - c) Pour-plate and spread plate
 - d) Pour plate
43. Plasmodium divides by which of the following method most commonly?
- a) Regeneration
 - b) Budding
 - c) Binary fission
 - d) Multiple fission
44. Vaccination was invented by.
- a) Watson
 - b) Jenner
 - c) Crick
 - d) Pasteur

45. Sulphates are reduced to hydrogen sulphide by
- a) Thiobacillus thiooxidans
 - b) Rhodospirillum
 - c) Desulfotomaculum sp.
 - d) Photosynthetic sulfur bacteria
46. Properties of stem cells do not include.....
- a) Potency
 - b) Self-renewal
 - c) Differentiation
 - d) Meiosis
47. The role of vitamins used in the cell culture media is.....
- a) Source of energy
 - b) Used for promotion of cell survival and growth.
 - c) Building block of proteins
 - d) All of the above
48. Ions responsible for cell adhesion, signal transduction and cell proliferation/ differentiation
- a) Na^+
 - b) K^+
 - c) Cl^-
 - d) Ca^{2+}
49. Trypan Blue is used for.
- a) Cell viability
 - b) Cell density counting
 - c) Cell imaging
 - d) All of the above

50. What is the concentration of carbon dioxide required for culturing animal cells?
- a) 15-20%
 - b) 25-50%
 - c) 1-10%
 - d) 2-8%
51. Totipotency refers to.....
- a) Development of fruits from flowers in a culture
 - b) Development of an organ from a cell in a culture medium
 - c) Flowering in a culture medium
 - d) All of the above
52. Cybrids are produced by.....
- a) The nucleus of one species but cytoplasm from both the parent species
 - b) The fusion of two same nuclei from the same species
 - c) The fusion of two different nuclei from different species
 - d) None of the above
53. What is Callus?
- a) Tissues that grow to form an embryoid
 - b) An unorganised actively dividing the mass of cells maintained in a culture
 - c) An insoluble carbohydrate
 - d) A tissue that grows from an embryo
54. The most common solidifying agent used in micropropagation is.....
- a) agar
 - b) dextran
 - c) Mannan
 - d) all of these

55. Which of the following is best suited method for production of virus free plants?
- a) Embryo culture
 - b) Meristem culture
 - c) Ovule culture
 - d) Anther culture
56. Which of the following is the first genetically engineered hormone?
- a) Oxytocin
 - b) Somatotropin
 - c) Insulin
 - d) Adrenaline
57. World's first cloned Buffalo was born in which country?
- a) India
 - b) USA
 - c) Russia
 - d) China
58. Which of the following is a genetically modified crop?
- a) Bt-cotton
 - b) Bt-brinjal
 - c) Golden rice
 - d) All of the above
59. The antibiotic resistance genes of a cloning vector are used.
- a) as selectable markers
 - b) to select healthy vectors
 - c) as sequences from where replication starts
 - d) to keep the cultures free from infections.

60. Which of the following statement (s) is/are always true about the process of cloning?

A. It is possible only in animals.

B. It results in the exact replication of the cell, a living part, or an organism.

C. It results in large number of off-springs.

a) A & B

b) Only B

c) B & C

d) Only A

61. Which of the following is not a symptom of Bean Mosaic disease?

a) Plants are bunchy

b) Leaves show mottling

c) Mosaic appearance on leaves

d) Blackening of leaflets

62. Which one of the following is a colonial alga?

a) Ulothrix

b) Spirogyra

c) Volvox

d) Chlorella

63. Find the incorrect statement

a) Agar-agar is produced from Gracilaria

b) Chlorella is used in space food

c) Mannitol is a food reserve of Rhodophyceae

d) Algin is produced by algae

64. Which of the following has non-flagellated isogamous gametes?

a) Spirogyra

c) Volvox

b) Chlamydomonas

d) Fucus

65. Which of the following contains chlorophyll a, b, phycoerythrin and phycocyanin?
- a) Chlorophyta
 - b) Phaeophyta
 - c) Rhodophyta
 - d) Bacillariophyta
66. Phycology is the study of.....
- a) Algae
 - b) Fungi
 - c) Bacteria
 - d) All the above
67. In biotechnological studies, the alga that is exploited as a rich source of protein is
- a) Spirogyra
 - b) Spirulina
 - c) Chlamydomonas.
 - d) Scytonema
68. Mucor is a.....
- a) Parasitic fungus
 - b) Saprophytic fungus
 - c) Facultative saprophytic fungus
 - d) None of the above
69. Find the true statement about bryophytes
- a) they have chloroplasts
 - b) they have archegonia
 - c) they are thalloid
 - d) all of the above
70. In India, coniferous forests are found in.....
- a) Himalayas
 - b) Western ghats
 - c) Eastern ghats
 - d) All the above

71. The study of relationships among different organisms is called.....
- a) Taxonomy
 - b) Biology
 - c) Systematics
 - d) Ornithology
72. Notochord is formed by.....
- a) Mesodermal cells
 - b) Ectodermal cells
 - c) Epidermal cells
 - d) Endodermal cells.
73. The property of not having separate sexes in an organism is called as.....
- a) Hermaphrodite
 - b) Oogamous
 - c) Homogamous
 - d) Heterogamous
74. The property of emitting light from a living organism is called as.....
- a) Bioluminescence
 - b) Phosphorescence
 - c) Biophosphorescence
 - d) Cytoluminescence
75. Salamander is an example of.....
- a) Reptile
 - b) Osteichthyes.
 - c) Amphibians
 - d) Mammals
76. The word morphology means.....
- a) Study of bones
 - b) Study of change
 - c) Study of skin
 - d) Study of structure
77. The locomotor organ of Echinoderms is called.....
- a) Parapodia
 - b) Pseudopodia
 - c) Setae
 - d) Tube feet

84. How is the genetic material expressed?
- a) By replication and transcription
 - b) By transcription and translation
 - c) By translation and modification
 - d) By mutation and transposition
85. Primosome is the complex of.....
- a) Helicase + Topoisomerase
 - b) Ligase + Helicase
 - c) Helicase + Primase
 - d) Primase + Ligase
86. The catalytic center of RNA polymerase is made up of.....subunits.
- a) α & β
 - b) β & β'
 - c) ω & σ
 - d) α & σ
87. Name the part of a chromosome where t-loop is found.
- a) Acromere
 - b) Centromere
 - c) Telomere
 - d) Tetraplex
88. Which of the following is not a termination codon?
- a) UGA
 - b) UAC
 - c) UAG
 - d) UAA
89. Linking number is always a.....
- a) Whole number
 - b) Prime number
 - c) Integer
 - d) Even number

90. The DNA replication is always.....
- a) Conservative
 - b) Semiconservative
 - c) Non-Conservative
 - d) Dispersive
91. Integrated Circuits were used in generation of computers.
- a) First
 - b) Second
 - c) Third
 - d) Fourth
92.is also known as auxiliary memory.
- a) Secondary storage
 - b) Random access memory
 - c) Primary storage
 - d) Cache memory
93. TELNET program is generally used for the purpose of
- a) Transcription
 - b) Remote communication
 - c) Encryption
 - d) Entertainment
94. Following among..... is a nucleotide sequence database.
- a) Swiss-Port
 - b) PubMed
 - c) DDBJ
 - d) PDB
95. Among followingterm used to define all input and output devices in a computer system.
- a) Software
 - b) Hardware
 - c) Shared resources
 - d) Monitor

96. A polymeric membrane is vesicular systems in which the drug is confined to a cavity or inner liquid core surrounded by.....
- a) Nano matrices
 - b) Nanoparticles
 - c) Nanocapsules
 - d) Nanowires
97. Nanomembranes have a pore size of.....
- a) 1nm-10nm
 - b) 10nm-100nm
 - c) 0.1 nm-1nm
 - d) 100nm-1000nm
98. Disease of the heart, joints and nervous system are called.
- a) Degenerative diseases
 - b) Communicable diseases
 - c) Deficiency diseases
 - d) Mental diseases
99. Hemophilia disease can be transferred through.....
- a) Heredity
 - b) Vector
 - c) Vehicle
 - d) Pollutant
100. Which of the following is a bacterial disease?
- a) Polio
 - b) Tuberculosis
 - c) Influenza
 - d) All of the above

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ROUGH WORK