

Seat No.	
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ENT - 47

Total No. of Pages : 24

**P. G. Re-Entrance Examination, 2024**  
**M. Sc. (Biochemistry/Biotechnology/  
Medical Information Management)**  
**Subject Code : 58725**

Day and Date : Friday, 28-06-2024

Total Marks : 100

Time : 12.30 p.m. to 02.00 p.m.

**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.

1. Integrated Circuits were used in .....generation of computers.

- |          |           |
|----------|-----------|
| a) First | b) Second |
| c) Third | d) Fourth |

2. ....is also known as auxiliary memory.

- |                      |                         |
|----------------------|-------------------------|
| a) Secondary storage | b) Random access memory |
| c) Primary storage   | d) Cache memory         |

3. TELNET program is generally used for the purpose of .....

- |                  |                         |
|------------------|-------------------------|
| a) Transcription | b) Remote communication |
| c) Encryption    | d) Entertainment        |

4. Following among ..... is a nucleotide sequence database.
- a) Swiss-Port
  - b) PubMed
  - c) DDBJ
  - d) PDB
5. Among following computer system..... term used to define all input and output devices in a
- a) Software
  - b) Hardware
  - c) Shared resources
  - d) Monitor
6. 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
7. Nanomembranes have a pore size of.....
- a) 1nm-10nm
  - b) 10nm-100nm
  - c) 0.1 nm-1nm
  - d) 100nm-1000nm
8. Disease of the heart, joints and nervous system are called.....
- a) Degenerative diseases
  - b) Communicable diseases
  - c) Deficiency diseases
  - d) Mental diseases
9. Hemophilia disease can be transferred through.....
- a) Heredity
  - b) Vector
  - c) Vehicle
  - d) Pollutant

10. Which of the following is a bacterial disease?
- a) Polio
  - b) Tuberculosis
  - c) Influenza
  - d) All of the above
11. 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
12. 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
13. 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

14. 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
15. 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  $\equiv$  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  $t_m$
16. 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

17. Which of the following is a choline-containing lipid?
- a) Phosphatidylethanolamine      b) Phosphatidylserine
  - c) Sphingomyelin                      d) Phosphatidylglycerol
18. 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
19. 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
20. Which of the following is the study of energy relationships and conversions in biological systems?
- a) Biochemistry                              b) Biophysics
  - c) Biotechnology                              d) Bioenergetics
21. Nucleosome is made up of.....
- a) DNA, histone core protein      b) DNA, histone core protein, linker H1
  - c) RNA, histone core protein      d) RNA, histone core protein, linker H1

22. Which of the following regarding the basic mechanism of gene expression is correct?
- a) DNA → tRNA → protein
  - b) DNA → mRNA → protein
  - c) RNA → mRNA → protein
  - d) DNA → protein
23. Which of the ribosome subunit NOT present in prokaryotes?
- a) 50s
  - b) 30s
  - c) 60s
  - d) None of the above
24. 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
25. Primosome is the complex of .....
- a) Helicase + Topoisomerase
  - b) Ligase + Helicase
  - c) Helicase + Primase
  - d) Primase + Ligase
26. The catalytic center of RNA polymerase is made up of.....subunits.
- a)  $\alpha$  &  $\beta$
  - b)  $\beta$  &  $\beta'$
  - c)  $\omega$  &  $\sigma$
  - d)  $\alpha$  &  $\sigma$

27. Name the part of a chromosome where t-loop is found.

- a) Acromere
- b) Centromere
- c) Telomere
- d) Tetraplex

28. Which of the following is not a termination codon?

- a) UGA
- b) UAC
- c) UAG
- d) UAA

29. Linking number is always a..

- a) Whole number
- b) Prime number
- c) Integer
- d) Even number

30. The DNA replication is always.....

- a) Conservative
- b) Semiconservative
- c) Non-Conservative
- d) Dispersive

31. Which of the following is not an important precursor of glucose in animals?

- a) Pyruvate
- b) Glucose 6-phosphate
- c) Lactate
- d) Glycerol

32. Which of the following are exclusively glucogenic?

- a) Lysine
- b) Leucine
- c) Threonine
- d) Arginine

33. 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
34. Which of the following plays a substantial role in linking together sister chromatids immediately after replication?
- a) Topoisomerases
  - b) Histones
  - c) Condensins
  - d) Cohesins
35. 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
36. 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
37. 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



38. Which of the following class of enzymes catalyze Hydrolysis reactions?

- a) Hydrolase
- b) Oxidoreductase
- c) Isomerase
- d) Ligase

39. Which of the following is an imino acid?

- a) Serine
- b) Alanine
- c) Glycine
- d) Proline

40. Which of the following is an example of epimers?

- a) Mannose & Glucose
- b) Glucose & Ribose
- c) Galactose & Mannose
- d) Glucose & Galactose

41. The study of relationships among different organisms is called.....

- a) Taxonomy
- b) Biology
- c) Systematics
- d) Ornithology

42. Notochord is formed by .....

- a) Mesodermal cells
- b) Ectodermal cells
- c) Epidermal cells
- d) Endodermal cells

43. The property of not having separate sexes in an organism is called as.....

- a) Hermaphrodite
- b) Oogamous
- c) Homogamous
- d) Heterogamous

44. The property of emitting light from a living organism is called as...

- a) Bioluminescence
- b) Phosphorescence
- c) Biophosphorescence
- d) Cytoluminescence

45. Salamander is an example of.....

- a) Reptile
- b) Osteichthyes
- c) Amphibians
- d) Mammals

46. The word morphology means.....

- a) Study of bones
- b) Study of change
- c) Study of skin
- d) Study of structure

47. The locomotor organ of Echinoderms is called.....

- a) Parapodia
- b) Pseudopodia
- c) Setae
- d) Tube feet

48. The genotypic ratio of a dihybrid cross is

- a) 3:1
- b) 1:2:1
- c) 12:3:1
- d) 9:3:3:1

49. The hormone testosterone is produced by.....

- a) Leydig cells
- b) Spermatocytes.
- c) Melanocytes
- d)  $\beta$  -cell of Pancreas

50. Which is the anti-coagulant substance in blood?

- a) Thrombin
- b) Globin
- c) Fibrinogen
- d) Heparin

51. The phenolphthalein indicator turns in alkaline medium.

- a) yellow
- b) colorless
- c) pink
- d) blue

52. The paper chromatography technique based on..

- a) adsorption
- b) partition
- c) absorption
- d) size

53. The clarified sugarcane juice contains....

- a) 20% water
- b) 60% water
- c) 85% water
- d) 0% water

54. The dielectric constant of water is.....

- a) 17.3
- b) 22
- c) 50
- d) 78.4

55. .... nm is the range of visible light.

- a) 180-400
- b) 400-800
- c) 100-180
- d) 800-1000

56. Which among the following is a Noble Gas?

- a) Nitrogen
- b) Hydrogen
- c) Oxygen
- d) Helium

57. What is the bond angle between H<sub>2</sub>O molecule?

- a) 90°
- b) 104.5°
- c) 120°
- d) 180°

58. In polar molecular solids, the molecules are held together by

- a) dipole-dipole interactions
- b) dispersion forces
- c) hydrogen bonds
- d) covalent bonds

59. Which of the following is a colligative property?

- a) Relative lowering of fluid pressure
- b) Decrease in boiling point
- c) Decrease in freezing point
- d) Change in volume after mixing

60. A pair of solution bears the same osmotic pressure. What is this pair of solutions called?

- a) Hypertonic
- b) Hypotonic
- c) Isotonic
- d) Osmolarity

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
- b) Chlamydomonas
- c) Volvox
- 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. 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. Which of the following solutions cannot conduct electricity?

- a) Sugar in water
- b) NaCl in water
- c) MgCl<sub>2</sub> in water
- d) KCl in water

72. Which of the following will lead to an increase in the rate of the reaction?

- a) Decrease in temperature
- b) Decreasing concentration of reactants
- c) Addition of catalyst
- d) Addition of inhibitor

73. Which of the following colloidal system represents a gel?

- a) Solid in liquid
- b) Solid in gas
- c) Liquid in solid
- d) Liquid in gas

74. Which of the following is the correct Gibbs equation?

- a)  $\Delta G = \Delta H + T\Delta S$
- b)  $\Delta G = \Delta H - T\Delta S$
- c)  $\Delta G = \Delta H - 2T\Delta S$
- d)  $\Delta G = \Delta H - 3T\Delta S$

75. Haemoglobin is a complex compound of which metal ion?

- a)  $\text{Fe}^{2+}$
- b)  $\text{Fe}^{3+}$
- c)  $\text{Co}^{2+}$
- d)  $\text{Mg}^{2+}$

76. Who is known as the father of Microbiology?

- a) Edwin John Butler
- b) Ferdinand Cohn
- c) Robert Koch
- d) Antoni van Leeuwenhoek

77. Which microorganism(s) among the following perform photosynthesis by utilizing light?
- a) Cyanobacteria, Fungi and Viruses
  - b) Viruses
  - c) Cyanobacteria
  - d) Fungi
78. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?
- a) Condenser lens
  - b) Magnifying lens
  - c) Objective lens
  - d) Eyepiece lens
79. What is the approximate size of the bacterial cell?
- a) 1 mm in diameter
  - b) 0.5 to 1.0 micrometer in diameter
  - c) 2 mm in diameter
  - d) 2 micrometer in diameter
80. The respiratory chain of bacteria is associated with the..
- a) cytoplasmic membrane
  - b) cell wall
  - c) cytoplasm
  - d) mitochondrial membrane



81. 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

82. 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

83. 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

84. The most common solidifying agent used in micropropagation is.....

- a) agar
- b) dextran
- c) Mannan
- d) all of these

85. 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
86. Which of the following is the first genetically engineered hormone?
- a) Oxytocin
  - b) Somatotropin
  - c) Insulin
  - d) Adrenaline
87. World's first cloned Buffalo was born in which country?
- a) India
  - b) USA
  - c) Russia
  - d) China
88. Which of the following is a genetically modified crop?
- a) Bt-cotton
  - b) Bt-brinjal
  - c) Golden rice
  - d) All of the above
89. 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

90. 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

91. 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

92. 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

93. Plasmodium divides by which of the following method most commonly?

a) Regeneration

b) Budding

c) Binary fission

d) Multiple fission

94. Vaccination was invented by.....

- a) Watson
- b) Jenner
- c) Crick
- d) Pasteur

95. Sulphates are reduced to hydrogen sulphide by .....

- a) Thiobacillus thiooxidans
- b) Rhodospirillum
- c) Desulfotomaculum sp.
- d) Photosynthetic sulfur bacteria

96. Properties of stem cells do not include.....

- a) Potency
- b) Self-renewal
- c) Differentiation
- d) Meiosis

97. 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

98. Ion responsible for cell adhesion, signal transduction and cell proliferation/  
differentiation is.....

- a) Na<sup>+</sup>
- b) K<sup>+</sup>
- c) Cl<sup>-</sup>
- d) Ca<sup>2+</sup>

99. Trypan Blue is used for.....

- a) Cell viability
- b) Cell imaging
- c) Cell density counting
- d) All of the above

100. What is the concentration of carbon dioxide required for culturing animal cells?

- a) 15-20%
- b) 25-50%
- c) 1-10%
- d) 2-8%



**- Rough Work -**

**ENT - 47**

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**ENT - 47**

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**ENT - 47**