

C 41690

(Pages : 16)

Name.....

Reg. No.....

P.G./INTEGRATED P.G. ENTRANCE EXAMINATION, APRIL 2023

BIOCHEMISTRY

Time : Two Hours

Maximum : 400 Marks

Each question carries 4 marks.

1 mark will be deducted for each wrong answer.

1. Identify the radioactive isotope.
 - (a) ^{13}C Carbon.
 - (b) ^{14}C Carbon.
 - (c) ^{16}O Oxygen.
 - (d) Deuterium (^2H).
2. The SI unit of radioactivity :
 - (a) Becquerel.
 - (b) Curie.
 - (c) Geiger.
 - (d) Radon.
3. As the pK_a of an acid increase, the acid will be :
 - (a) More weaker.
 - (b) More stronger.
 - (c) Converted to neutral solution.
 - (d) Converted to basic solution.
4. Normal pH of blood is :
 - (a) 7.0.
 - (b) 7.2.
 - (c) 7.3.
 - (d) 7.4.
5. The principal cation in extracellular fluid is :
 - (a) Sodium.
 - (b) Potassium.
 - (c) Calcium.
 - (d) Magnesium.
6. What symbol is used to denote 'molarity' ?
 - (a) M.
 - (b) m.
 - (c) mM.
 - (d) n.

Turn over

7. Which cell organelle is involved in apoptosis :
- (a) Lysosome. (b) ER.
(c) Golgi. (d) Mitochondria.
8. Which of the following is energy independent ?
- (a) Active transport. (b) Primary active transport.
(c) Secondary active transport. (d) Passive transport.
9. Which amino acid is abundantly found in collagen ?
- (a) Tryptophan. (b) Alanine.
(c) Glycine. (d) Serine.
10. ——— is an example of epimers ?
- (a) Mannose and Glucose. (b) Glucose and Ribose.
(c) Galactose and Mannose. (d) Glucose and Galactose.
11. Glucose residues are linked β C1 – C4 glycosidic bonds in ———.
- (a) Starch. (b) Cellulose.
(c) Glycogen. (d) Amylose
12. Which of the following sugars give a positive test with Selliwanoff test ?
- (a) Glucose. (b) Galactose.
(c) Mannose. (d) Fructose.
13. Sugar present in DNA is ———.
- (a) β D ribose. (b) β D 2 deoxy ribose.
(c) α L ribose. (d) α deoxy ribose.

14. ——— is a choline-containing lipid ?
- (a) Phosphatidy lethanolamine. (b) Phosphatidylserine.
(c) Sphingomyelin. (d) Phosphatidy lglycerol.
15. A fatty acid which is not synthesized in the body and has to be supplied in the diet is :
- (a) Palmitic acid. (b) Lauric acid.
(c) Linolenic add. (d) Palmitic acid.
16. A Vitamin that helps blood clotting is :
- (a) Vit A. (b) Vit C
(c) Vit K. (d) Vit B6.
17. The primary structure of protein represents :
- (a) Linear sequence of amino acids joined by peptide bond.
(b) 3-dimensional structure of protein.
(c) Helical structure of proteins.
(d) Subunit structure of proteins
18. All are sequence alignment tools *except* :
- (a) Rasmol. (b) BLAST.
(c) FASTA. (d) Clustal W.
19. Which is a water-soluble vitamin :
- (a) Vitamin D. (b) Vitamin K.
(c) Vitamin C. (d) Vitamin A.
20. Nucleic acids and proteins absorb light respectively at :
- (a) 280 and 260 nm. (b) 260 and 280 nm.
(c) 270 and 280 nm. (d) 260 and 270 nm.

21. Coenzyme involved in carboxylation reaction is :

- (a) Thiamine pyrophosphate.
- (b) Pyridoxal phosphate.
- (c) Biotin.
- (d) NADP.

22. Ribozymes are by nature :

- (a) Heteropoly saccharides.
- (b) Ribosomal proteins.
- (c) Tipoproteins.
- (d) Ribonucleic acids.

23. V_{max} of an enzyme may be affected by :

- (a) pH.
- (b) Temperature.
- (c) Enzyme concentration.
- (d) All of these.

24. Which of the following takes part in hydrogen transfer reactions ?

- (a) Tetrahydrofolate.
- (b) Coenzyme A.
- (c) NAD.
- (d) Biotin.

25. In competitive inhibition, the inhibitor :

- (a) Competes with the enzyme.
- (b) Irreversibly binds with the enzyme.
- (c) Binds with the substrate.
- (d) Competes with the substrate.

26. Feedback inhibition of enzyme is influenced by :

- (a) Enzyme.
- (b) External factors.
- (c) End product.
- (d) Substrate.

27. Isoenzymes are :

- (a) Different forms of an enzyme that have different electrophoretic mobility but catalyse the same reaction.
- (b) Different forms of an enzyme similar in all properties.
- (c) Catalysing different reactions.
- (d) Regulatory metabolites.

28. In column chromatography, the stationary phase is made of _____ and the mobile phase is made of _____.

- (a) Solid, liquid.
- (b) Liquid, liquid.
- (c) Liquid, gas.
- (d) Solid, gas.

29. Which of the following factors does not influence electrophoretic mobility ?

- (a) Molecular weight.
- (b) Shape of molecule.
- (c) Size of molecule.
- (d) Stereochemistry of molecule.

30. In a gel filtration column :

- (a) Smaller proteins enter the beads more readily.
- (b) Large proteins elute first.
- (c) Both (a) and (b).
- (d) Large proteins enter the beads more readily.

31. In the electron transport chain the final acceptor of electron is :

- (a) Cytochrome b.
- (b) Cytochrome a.
- (c) Oxygen.
- (d) CoQ.

Turn over

32. Fructose 1 6 diphosphate is cleaved into glyceraldehyde 3 phosphate and dihydroxy acetone phosphate by :
- (a) Enolase.
 - (b) Aldolase.
 - (c) Dihydroxylase.
 - (d) Phospho fructokinase
33. Carnitine is required for the transport of :
- (a) Cholesterol into liver.
 - (b) Triglycerides into mitochondria.
 - (c) Short chain fatty acids into mitochondria.
 - (d) Long chain fatty acids into mitochondria.
34. Transamination reactions are carried out by _____.
- (a) Aminotransferases.
 - (b) Aminoacid carboxylase.
 - (c) Aminoacid oxidases.
 - (d) Dehydrogenase.
35. Which of the following is the Complex I of the ETS ?
- (a) NADH dehydrogenase.
 - (b) Cytochrome aa3.
 - (c) Cytochrome bc1.
 - (d) ATP synthase.
36. Which of the following is correct sequence of processes in the oxidation of glucose ?
- (a) Krebs cycle - glycolysis - electron transport.
 - (b) Glycolysis - Krebs cycle - electron transport.
 - (c) Electron transport - Krebs cycle - glycolysis.
 - (d) Krebs cycle - electron transport - glycolysis.
37. Which of the following metabolite integrates glucose and fatty acid metabolism ?
- (a) Acetyl CoA.
 - (b) Pyruvate.
 - (c) Citrate.
 - (d) Lactate.

38. An uncoupler of oxidative phosphorylation such as dinitrophenol :
- (a) Inhibits electron transport and ATP synthesis.
 - (b) Allow electron transport to proceed but disrupts ATP synthesis.
 - (c) Inhibits electron transport without impairment of ATP synthesis.
 - (d) Specially inhibits complex 1.
39. The enzymes of β -oxidation are found in :
- (a) Mitochondria.
 - (b) Cytosol.
 - (c) Golgi apparatus.
 - (d) Nucleus.
40. Which organ synthesizes ketone bodies ?
- (a) Liver.
 - (b) Skeletal muscles.
 - (c) Kidney.
 - (d) Brain.
41. The rate limiting step of urea cycle is mediated by :
- (a) Arginase.
 - (b) Carbamoyl phosphate synthetase I.
 - (c) Arginosuccinate synthetase.
 - (d) Ornithine transcarbamoylase.
42. Albinism is caused by the deficiency of :
- (a) Tyrosinase.
 - (b) HMG CoA reductase.
 - (c) Phenylalanine hydroxylase.
 - (d) Arginase.
43. Where does the photosynthesis take place ?
- (a) Leaves.
 - (b) Chloroplast.
 - (c) Flowers.
 - (a) Root.
44. The bacterial cell multiplication is usually by :
- (a) Mitosis.
 - (b) Meiosis.
 - (c) Binary-fission.
 - (d) Conjugation.

Turn over

45. Conversion of inosine monophosphate to xanthine monophosphate is catalysed by :
- (a) IMP dehydrogenase.
 - (b) Formyl transferase.
 - (c) Xanthine-guanine phosphoribosyl transferase.
 - (d) Adenine phosphoribosyl transferase.
46. Which is the committed step of pyrimidine synthesis that exhibits allosteric inhibition by cytidine triphosphate :
- (a) Aspartate transcarbamoylase.
 - (b) Hypoxanthine Guanine phosphoribosyl Transferase.
 - (c) Thymidylate synthase.
 - (d) Xanthine oxidase.
47. Pyrimidine and purine nucleoside biosynthesis share a common precursor :
- (a) PRPP.
 - (b) Glycine.
 - (c) Fumarate.
 - (d) Alanine.
48. Which metal is present in the chloroplasts ?
- (a) Iron.
 - (b) Manganese.
 - (c) Magnesium.
 - (d) Cobalt.
49. In photosynthesis light energy is converted to :
- (a) Kinetic energy.
 - (b) Thermal energy.
 - (c) Chemical energy.
 - (d) Physical energy.
50. Isoelectric pH of an amino acid is that pH at which it has a :
- (a) Positive charge.
 - (b) Negative charge.
 - (c) Neutral charge.
 - (d) All of these.
51. ——— is a gaseous plant hormone.
- (a) IBA.
 - (b) Ethylene.
 - (c) Absciscic acid.
 - (d) NAA.

52. Name the class of secondary metabolites which is characterized by the presence of the hydroxyl group with an aromatic ring ?
- (a) Glycosides. (b) Phenolics.
(c) Alkaloids. (d) Terpenes.
53. The thick filaments in myofibrils are composed almost entirely of :
- (a) Actin. (b) Myosin.
(c) Troponin. (d) Tropomyosin.
54. The basic structure of antibodies are ———.
- (a) Y-shaped. (b) X-shaped.
(c) Linear. (d) Hyperbolic.
55. Which immunoglobulin can pass through placenta ?
- (a) IgD. (b) IgE.
(c) IgM. (d) IgG.
56. Name the class of immunoglobulin which takes part in hypersensitivity reaction ?
- (a) IgG. (b) IgE.
(c) IgA. (d) IgM.
57. Which of these is NOT a characteristic feature of adaptive immunity ?
- (a) Immunogenic memory. (b) Antigen nonspecific.
(c) Self/non-self recognition. (d) Diversity.
58. 2D gel electrophoresis separates proteins based on :
- (a) Molecular mass
(b) Differences in isoelectric points
(c) Affinity to gel
(d) Both (a) and (b).

59. The immunity acquired by inoculation of living organism of attenuated virulence is :
- (a) Artificial active immunity.
 - (b) Passive immunity.
 - (c) Natural active immunity.
 - (d) Local immunity.
60. Differential staining of bacteria on Gram staining is due to
- (a) Difference in the cell wall components of Gram positive and Gram negative bacteria.
 - (b) Difference in the cell structure of Gram positive and Gram negative bacteria.
 - (c) Difference in the mode of nutrition of Gram positive and Gram negative bacteria.
 - (d) None of the above
61. What is the principle of ELISA ?
- (a) Amplification.
 - (b) Antigen antibody interaction.
 - (c) Adhesion.
 - (d) Adsorption.
62. Western blotting is the technique for the detection of :
- (a) Specific DNA in a sample.
 - (b) Specific RNA in a sample.
 - (c) Specific protein in a sample.
 - (d) Specific glycolipid in a sample.
63. Bacterial cell wall is made up of :
- (a) Chitin.
 - (b) Cellulose.
 - (c) Dextran.
 - (d) Peptidoglycan.
64. Which cell produces antibodies ?
- (a) Monocytes.
 - (b) Basophils.
 - (c) Lymphocytes.
 - (d) NK cells.
65. Coenzyme A contains the vitamin :
- (a) Riboflavin.
 - (b) Pantothenic acid.
 - (c) Pyridoxine.
 - (d) Thiamine.

66. What is the basic principle of immunisation and vaccination ?
- (a) It is based on the number of B and T lymphocytes.
 - (b) It is based on the property of memory of the immune system.
 - (c) It is based on antigen-anti body interactions.
 - (d) It is based upon the number of white blood cells.
67. Gout is due to the accumulation of :
- (a) Urea.
 - (b) Uric acid.
 - (c) Creatinine.
 - (d) Ornithine.
68. Which of the following best reflects kidney function ?
- (a) Glucose.
 - (b) Creatinine.
 - (c) LDL.
 - (d) HDL.
69. Which of the following plasma enzymes is increased in alcoholic subjects ?
- (a) Alkaline phosphatase.
 - (b) Acid Phosphatase.
 - (c) Lactate dehydrogenase.
 - (d) Gamma-glutamyl transferase.
70. Which of the following is not a liver function test ?
- (a) Serum Bilirubin.
 - (b) SGPT.
 - (c) Albumin.
 - (d) Urea.
71. HbA1c analysis reveals the mean glucose level over the previous :
- (a) 12 months.
 - (b) 2 to 3 months.
 - (c) 6 months.
 - (d) 8 months.
72. If sample is taken in EDTA tube, which of the following biochemistry test result will affect ?
- (a) Glucose.
 - (b) Urea.
 - (c) Cholesterol.
 - (d) Calcium.

73. Beriberi is caused by deficiency of :
- (a) Vitamin B1.
 - (b) Vitamin B12.
 - (c) Vitamin B2.
 - (d) Vitamin B3.
74. The hormone which regulates the basal metabolism in our body is secreted from ?
- (a) Pancreas.
 - (b) Adrenal cortex.
 - (c) Thyroid.
 - (d) Pituitary gland.
75. Which of the following is an example of attenuated vaccine ?
- (a) Tetanus.
 - (b) Hepatitis B.
 - (c) Meningococcal.
 - (d) Smallpox.
76. Neurotransmitters carry signals across the _____.
- (a) Refractory gap.
 - (b) Axonal gap.
 - (c) Synaptic gap.
 - (d) Hippocampal gap.
77. The enzyme amino acyl tRNA synthetase is involved in :
- (a) Dissociation of discharged tRNA from 80S ribosome.
 - (b) Charging of tRNA with specific amino acids.
 - (c) Termination of protein synthesis.
 - (d) Nucleophilic attack on esterified carboxyl group of peptidyl tRNA
78. In DNA replication the enzyme required in the first step is :
- (a) DNA directed polymerase.
 - (b) RNA poly merase.
 - (c) DNA ligase.
 - (d) Helicase.
79. Sigma and Rho factors are required for :
- (a) Replication.
 - (b) Transcription.
 - (c) Translation.
 - (d) Polymerisation.

80. Pyrimidine dimers are formed on :

- (a) Exposure to UV light.
- (b) On exposure to dark.
- (c) On exposure to X rays.
- (d) On exposure to IR rays.

81. Chromosome constitution of normal human males can be written as :

- (a) 46.
- (b) $44 + 2$.
- (c) $44A + XY$.
- (d) $44A + XX$.

82. Anticodons are present on :

- (a) Coding strand of DNA.
- (b) mRNA.
- (c) tRNA.
- (d) rRNA.

83. Golden rice is a genetically modified crop plant where the incorporated genes are meant for biosynthesis of _____.

- (a) Vitamin A.
- (b) Vitamin C.
- (c) vitamin B.
- (d) Beta-carotene.

84. The trp operon transcribed when :

- (a) Trypsin is needed in the cell.
- (b) Trypsinogen is available to the cell.
- (c) There is not much tryptophan in the cell.
- (d) There is lot of tryptophan in the cell.

85. Restriction enzymes are named for :

- (a) The person who discovered.
- (b) The bacterium they are derived from.
- (c) The viral DNA that they attack.
- (d) None of the above.

Turn over

86. Which enzyme is used for joining two different types of DNA molecules?
- (a) Ligase. (b) Endonuclease.
(c) Exonuclease. (d) Protease.
87. Who developed the chemical techniques to synthesize polynucleotides ?
- (a) Barbara McClintock. (b) James Watson.
(c) Fredrick Sanger. (d) H. Gobind Khorana
88. The most important feature in a plasmid to be used as a vector is ———.
- (a) Origin of replication(ori).
(b) Presence of a selectable marker.
(c) Presence of sites for restriction endonuclease.
(d) Its size.
89. The virus mediated gene transfer using genetically modified bacteriophage is called :
- (a) Transformation. (b) Transduction.
(c) Transfection. (d) Conjugation.
90. Introduction of DNA into cells by exposing to high electric pulse :
- (a) Electroporation. (b) Electrophoresis.
(c) Electro fission. (d) Electrolysis.
91. Glucagon is secreted by which type of pancreatic cell :
- (a) Beta cells. (b) Alpha cells
(c) D cells(Delta cells). (d) F cells (PP cells).
92. Thyroid hormones are synthesized by the iodination of ——— amino acid :
- (a) Phenylalanine. (b) Lysine.
(c) Tyrosine. (d) Glycine.

93. A hormone or ligand can be considered as ———.

- (a) First messenger.
- (b) Second messenger.
- (c) Third messenger.
- (d) Fourth messenger.

94. G protein coupled receptor is :

- (a) An intracellular receptor.
- (b) Extracellular receptor with no intracellular domain.
- (c) 5 transmembrane domain receptors.
- (d) 7 transmembrane domain receptors.

95. Which of the following is true of estrogens ?

- (a) Responsible for high pitch voice.
- (b) Regulation of female sexual behaviour.
- (c) Regulation of the growth of female secondary organs.
- (d) All of the above.

96. The hormone required for uterine muscle contraction for childbirth is :

- (a) Progesterone.
- (b) Estrogen.
- (c) Oxytocin.
- (d) Vasopressin.

97. The hormone measured in urine to test pregnancy is :

- (a) Anterior pituitary luteinizing hormone.
- (b) Androgen.
- (c) Estrogen.
- (d) Chorionic gonadotropin.

98. Steroid hormones are synthesised from :

- (a) Cholesterol.
- (b) 7-Dehydrocholesterol.
- (c) Calcitriol.
- (d) 7-Hydroxycholesterol.

99. Which of these is a second messenger ?

- (a) ATP.
- (b) cAMP
- (c) AMP.
- (d) GTP

100. Which of the following transports only one kind of substrate ?

- (a) Uniport carriers.
- (b) Symport carriers.
- (c) Antiport carriers.
- (d) Membrane proteins.