

P.G. ENTRANCE EXAMINATION, APRIL 2022

BIOCHEMISTRY

Time : Two Hours

Maximum : 200 Marks

*Each question carries 4 marks.**1 mark will be deducted for each wrong answer.*

- Which of the following is not a radioactive isotope ?
 - Carbon 13.
 - Carbon 14.
 - Sulphur 35.
 - Iodine 125.
- Liquid scintillation counters are used mainly for detecting :
 - Alpha emitters.
 - Beta emitters.
 - X rays.
 - Gamma rays.
- As the pKa of an acid increases the acid will be :
 - Stronger.
 - Weaker.
 - Converted to neutral solution.
 - Converted to alkaline solution.
- pH of the buffer solution depends upon :
 - Acid (H^+) only.
 - Base ($-OH^-$) only.
 - Salt.
 - Acid (H^+) and its conjugate base ($-OH^-$).
- The polymerase chain reaction relies upon heat-resistant _____ isolated from bacteria living in hot springs.
 - Plasmids.
 - DNA polymerase.
 - mRNA.
 - restriction enzymes.

Turn over

6. The enzyme is more efficient in catalysis when K_m value is :
- a) Low.
 - b) High.
 - c) Zero.
 - d) Infinity.
7. During glycolysis the following reaction requires NAD^+ :
- a) Alcohol dehydrogenase.
 - b) Glyceraldehyde-3-phosphate dehydrogenase.
 - c) Lactate dehydrogenase.
 - d) Pyruvate dehydrogenase.
8. Rate limiting enzyme in cholesterol biosynthesis is :
- a) HMG CoA reductase.
 - b) HMG CoA synthase.
 - c) Acetyl CoA carboxylase.
 - d) Cholesterol synthase.
9. Which of the following is not correctly matched ?
- a) Vitamin A---fat soluble.
 - b) Vitamin C---water soluble.
 - c) Vitamin E---water soluble.
 - d) Vitamin D---fat soluble.
10. The term partition coefficient is related to :
- a) TLC.
 - b) Gel filtration.
 - c) RIA.
 - d) PAGE.
11. A plot of $[V]$ against $[S]$ for an allosteric enzyme is a _____ curve.
- a) Hyperbola.
 - b) Parabolic.
 - c) Sigmoidal.
 - d) None of the above.

12. A plot of enzyme activity (y-axis) vs. pH (x-axis) with other variables constant is a :
- Straight line with an upward slope.
 - Line with an upward slope and a long flat top.
 - Line with an upward slope followed by a downward slope.
 - Straight horizontal line.
13. Which of these is an aldotriose ?
- Dihydroxy acetone.
 - Sucrose.
 - Glyceraldehyde.
 - Ribulose.
14. The glycosidic linkage between cellulose is :
- β 1-4.
 - α 1-4.
 - β 1-2.
 - α 1-2.
15. Two-dimensional gel electrophoresis is used to _____.
- Separate DNA fragments.
 - Separate RNA fragments.
 - Separate different proteins.
 - Observe a protein in two dimensions.
16. Which of the following is a sequence alignment tool :
- BLAST.
 - PHLYIP.
 - PROSITE.
 - RASMOL.
17. Lactose is a disaccharide of :
- Glucose and fructose.
 - Glucose and mannose.
 - Glucose and glucose.
 - Glucose and galactose.

18. After osazone test the sample sugar gave sunflower or star shaped crystals, the sample sugar will be :
- a) Fructose.
 - b) Glucose.
 - c) Maltose.
 - d) Mannose.
19. _____ amino acid will be absent in alpha helix structure of proteins :
- a) Glutamic acid.
 - b) Proline.
 - c) Lysine.
 - d) Alanine.
20. What is the single letter code for selenocysteine ?
- a) S.
 - b) C.
 - c) U.
 - d) I.
21. When pH of the solution is above PI, amino acids will be :
- a) Cationic.
 - b) No charge.
 - c) Anionic.
 - d) Net charge zero.
22. _____ Amino acid in proteins is responsible for the characteristic absorption of UV light at 280 nm.
- a) Glycine.
 - b) Tryptophan.
 - c) Glutamic acid.
 - d) Lysine.
23. Which of the following is true for allosteric inhibition of an enzyme ?
- a) It always leads to a reduced binding of substrate.
 - b) The inhibitor binds to some other site than the active site of the enzyme.
 - c) The inhibitor binds to the active site of the enzyme.
 - d) It causes the enzyme to work faster.

31. A sodium-potassium pump is an example of which type of pump ?
- A primary active transport system.
 - A secondary active transport system.
 - A primary passive transport system.
 - A secondary passive transport system.
32. Protein subunit studies can be done by :
- Native PAGE.
 - Ion exchange.
 - Paper chromatography.
 - SDS-PAGE.
33. In the electron transport final acceptor of electron is :
- Cytochrome b.
 - Cytochrome a.
 - Oxygen.
 - CoQ.
34. Which hormone given below is NOT a cholesterol derivative ?
- Testosterone.
 - Estrogen.
 - Cortisol.
 - Prostaglandins.
35. Which of the following proteins is a protease of the blood clotting pathway ?
- Prothrombin.
 - Fibrin.
 - Factor IX.
 - Factor XIII.
36. A mouse in which one specific gene has been replaced by its inactivated form generated in vitro is called :
- Transgenic mouse.
 - Knockout mouse.
 - Nude mouse.
 - Mutant mouse.
37. What is the order of events in PCR ?
- Annealing, denaturation, extension.
 - Denaturation, extension, annealing.
 - Annealing, extension, denaturation.
 - Denaturation, annealing, extension.

38. Which mRNA will be translated to a polypeptide chain containing 8 amino acids ?
- AUGUAAUAGACGAGUAGCGACGAUGU.
 - AUGAGACGGACUGCAUUCCCAACCCUGA.
 - AUGCCCAACCGUUAUUCAUGCUAG.
 - AUGUCGACAGUCUAAAACAGCGGG.
39. In a nucleotide, the nitrogen base is joined to the sugar molecule by :
- Phosphodiester bond.
 - Glycosidic bond.
 - Hydrogen bond.
 - (a) and (b).
40. Folic acid is important for :
- One carbon metabolism.
 - Fatty acid synthesis.
 - Fatty acid oxidation.
 - Gluconeogenesis.
41. Where do T-lymphocytes develop into fully competent but not activated T-cells ?
- Thyroid gland.
 - Thymus gland.
 - Bone marrow.
 - Lymph nodes.
42. What happens if citrate concentration is increased during glycolysis ?
- Inhibits triose phosphate isomerase.
 - Inhibits phosphoglyceratekinase.
 - Inhibits phosphofructokinase.
 - 4 Inhibits hexokinase.
43. Which of the following amino acid cannot form disulfide bridge ?
- Cysteine.
 - Cystine.
 - Selenocysteine.
 - Methionine.

