D 123846 (Pages : 8) Name.....

Reg. No.....

CALICUT UNIVERSITY CENTRALIZED ENTRANCE TEST (CU-CET)
APRIL 2025

M.Sc. BIOCHEMISTRY

Time : Two Hours Maximum : 200 Marks

Each question carries 4 marks.

1 mark will be deducted for each wrong answer.

1. What is the first step in managing laboratory accidents or injuries ?

   (a) Informing a supervisor. (b) Administering first aid.

   (c) Documenting the incident. (d) Evacuating the area.

2. Which of the following is a weak acid ?

   (a) HCl. (b) CH3COOH.

   (c) H2 SO4. (d) NH4OH.

3. What is molality ?

   (a) Moles of solute per liter of solution.

   (b) Moles of solute per kilogram of solvent.

   (c) Moles of solvent per liter of solution.

   (d) Moles of solvent per kilogram of solute,.

4. What is the Tyndall effect ?

   (a) The scattering of light by colloidal particles.

   (b) The absorption of light by colloidal particles.

   (c) The change in viscosity of a colloidal solution.

   (d) The colour change of a colloidal solution.

5. Which of the following is NOT a subcellular organelle ?

   (a) Nucleus. (b) Ribosome.

   (c) Plasma membrane. (d) Endoplasmic reticulum.

6. What is the function of mitochondria in the cell ?

(a) Protein synthesis.
(b) Energy production.
(c) Waste disposal.
(d) Cellular communication.

7. Which of the following is NOT a component of the cytoskeleton ?

(a) Microfilaments.
(b) Microtubules.
(c) Intermediate filaments.
(d) Ribosomes.

8. Which of the following is an example of facilitated transport ?

(a) Movement of water through aquaporins.
(b) Movement of ions through ion channels.
(c) Movement of glucose through GLUT transporters.
(d) Movement of oxygen through the lipid bilayer.

9. What is the function of ion channels in cellular transport ?

(a) To pump ions against their concentration gradient.
(b) To selectively allow ions to pass through the membrane.
(c) To neutralize charged particles within the cell.
(d) To regulate osmotic pressure.

10. What is the primary role of Na+-K+ ATPase ?

(a) Maintaining osmotic balance.
(b) Facilitating passive diffusion.
(c) Establishing membrane potential.
(d) Generating ATP.

11. What are cadherins ?

(a) Enzymes involved in cell signalling.
(b) Proteins that mediate cell-cell adhesion.
(c) Receptors for neurotransmitters.
(d) Transporters for ion channels.

12. Inhibitors of transcription primarily target :

(a) RNA polymerase. (b) DNA polymerase.

(c) Helicase. (d) Topoisomerase.

13. What is the primary function of desmosomes ?

(a) Facilitating communication between cells.

(b) Preventing movement of substances between cells.

(c) Anchoring cells together.

(d) Regulating osmotic pressure.

14. Ame's test is used for the detection of :

(a) Mutations induced by chemical mutagens.

(b) Spontaneous mutations.

(c) Mutations induced by UV light.

(d) Chromosomal aberrations.

15. What are the phases of the cell cycle ?

(a) Interphase and mitosis

(b) G1, S, G2, and mitosis

(c) Prophase, metaphase, anaphase, and telophase.

(d) Prophase, anaphase, metaphase, and cytokinesis.

16. The lipid profile typically includes the measurement of :

(a) Hemoglobin levels.

(b) Triglycerides and cholesterol.

(c) Liver enzymes.

(d) Kidney function markers.

17. What is the normal fasting blood sugar level ?

(a) <70 mg/dL. (b) 70 – 99 mg/dL

(c) 100-125 mg/dL. (d) >126 mg/dL.

18. What distinguishes prokaryotic cells from eukaryotic cells ?

(a) Presence of a nucleus.

(b) Presence of membrane-bound organelles.

(c) Size.

(d) Complexity.

19. Which of the following is a pentose ?

(a) Glucose.

(b) Ribose.

(c) Fructose.

(d) Galactose.

20. How can you differentiate between saturated and unsaturated fats in a given solution ?

(a) By performing a Sudan III test.

(b) By conducting a Ninhydrin test.

(c) By observing the formation of a white precipitate with silver nitrate.

(d) By measuring the iodine value.

21. Which of the following is a sugar alcohol ?

(a) Glucose.

(b) Ribose.

(c) Mannitol.

(d) Glucosamine.

22. Cellulose is an example of :

(a) Homopolysaccharide.

(b) Heteropolysaccharide.

(c) Disaccharide.

(d) Oligosaccharide.

23. Which form of amino acids is commonly found in proteins ?

(a) D-form.

(b) L-form.

(c) Racemic mixture.

(d) DL-form.

24. Which dihedral angles are commonly used to describe the backbone conformation of peptides ?

(a) Alpha and beta angles.

(b) Phi and Psi angles.

(c) Omega and gamma angles.

(d) Delta and epsilon angles.

25. Which of the following is a micro mineral or trace element ?

(a) Calcium. (b) Phosphorus.

(c) Zinc. (d) Magnesium.

26. Which vitamin is synthesized by the skin in response to sunlight ?

(a) Vitamin A. (b) Vitamin D.

(c) Vitamin K. (d) Vitamin E.

27. Which sugar derivative is important in the structure of bacterial cell walls ?

(a) Glucosamine. (b) Mannitol.

(c) Sorbitol. (d) Xylitol.

28. Which neurotransmitter is commonly associated with mood regulation and is targeted by many antidepressant drugs ?

(a) Acetylcholine. (b) GABA.

(c) Serotonin. (d) Dopamine.

29. Which polysaccharide serves as an energy storage molecule in animals ?

(a) Cellulose. (b) Starch.

(c) Glycogen. (d) Chitin.

30. Which amino acid is commonly found in collagen ?

(a) Proline. (b) Arginine.

(c) Asparagine. (d) Cysteine.

31. Which hormone is an example of an oligopeptide ?

(a) Insulin. (b) Oxytocin.

(c) Glucagon. (d) Thyroxine.

32. Which of the following is a natural anticoagulant produced by the body ?

(a) Heparin. (b) Vitamin K.

(c) Thrombin. (d) Calcium ions.

33. Which lipid serves as a major component of cell membranes ?

(a) Triacylglycerol.
(b) Cholesterol.
(c) Phospholipid.
(d) Steroid hormone.

34. What is the significance of the Tm-value in nucleic acid studies ?

(a) It indicates the melting temperature of DNA *or* RNA.
(b) It represents the translation rate of mRNA.
(c) It measures the amount of free energy in a nucleic acid sequence.
(d) It quantifies the expression level of genes.

35. What type of bond links nucleotides in a polynucleotide chain ?

(a) Peptide bond.
(b) Glycosidic bond.
(c) Phosphodiester bond.
(d) Hydrogen bond.

36. What is the primary principle behind 2D electrophoresis ?

(a) Separation based on size and charge.
(b) Separation based on molecular weight.
(c) Separation based on affinity.
(d) Separation based on isoelectric point.

37. Which law governs the relationship between absorbance, concentration, and path length in spectrophotometry ?

(a) Boyle's law.
(b) Charles's law.
(c) Beer-Lambert's law.
(d) Dalton's law.

38. What is the primary function of SDS in SDS-PAGE ?

(a) To denature proteins.
(b) To reduce disulfide bonds.
(c) To impart a negative charge to proteins.
(d) To separate proteins based on charge.

39. Which type of radiation is commonly used in radioimmunoassay ?

(a) Alpha radiation.
(b) Beta radiation.
(c) Gamma radiation.
(d) X-ray radiation.

40. Which of the following is not a component of a buffer solution ?

(a) Weak acid.
(b) Strong acid.
(c) Conjugate base.
(d) Weak base.

41. Which of the following is NOT a structural component of a nucleotide ?

(a) Base.
(b) Sugar.
(c) Amino group.
(d) Phosphoric acid.

42. Which instrument is used to measure radioactivity in a sample ?

(a) Gas chromatograph.
(b) Mass spectrometer.
(c) Gamma counter.
(d) Atomic absorption spectrometer.

43. Which of the following techniques is used to break open cells by subjecting them to high-frequency sound waves ?

(a) Dialysis.
(b) Ultrafiltration.
(c) Sonication.
(d) Lyophilization.

44. What does a 10 % (w/v) solution of glucose mean ?

(a) 10 grams of glucose dissolved in 100 ml of solvent.
(b) 10 grams of glucose dissolved in 1 liter of solvent.
(c) 10 ml of glucose dissolved in 100 ml of solvent.
(d) 10 ml of glucose dissolved in 1 liter of solvent.

45. What is specific activity of an enzyme ?

(a) Total activity of the enzyme in solution.
(b) Activity of the enzyme per unit mass of protein.
(c) Activity of the enzyme per unit volume of solution.
(d) Activity of the enzyme per unit mole of substrate.

46. What is the primary role of the glyoxylate pathway in metabolism ?

(a) Production of ATP.

(b) Synthesis of glucose from fatty acids.

(c) Oxidation of NADH.

(d) Regulation of citric acid cycle.

47. What term refers to the difference in free energy between reactants and products in a chemical reaction ?

(a) Entropy. (b) Enthalpy.

(c) Gibbs free energy. (d) Activation energy.

48. A solution containing albumin primarily consists of :

(a) Carbohydrates. (b) Proteins.

(c) Lipids. (d) Amino acids.

49. Which method is commonly used to determine the concentration of a protein solution ?

(a) Benedict's test. (b) Biuret test.

(c) Molisch's test. (d) Saponification.

50. A holoenzyme consists of :

(a) Protein component only. (b) Cofactor only.

(c) Apoenzyme and cofactor. (d) Prosthetic group only.