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Name.....

Reg. No.....

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

M.Sc. BIOTECHNOLOGY / M.Sc. GENERAL BIOTECHNOLOGY

Time : Two Hours

Maximum : 200 Marks

*Each question carries 4 marks.*

*1 mark will be deducted for each wrong answer.*

1. Which element is present in all organic compounds ?  
(a) Hydrogen. (b) Carbon.  
(c) Oxygen. (d) Nitrogen.
2. Which of the following is a transition metal ?  
(a) Calcium. (b) Iron.  
(c) Sodium. (d) Potassium.
3. Which of the following is NOT a macromolecule found in living organisms ?  
(a) Lipid. (b) Monosaccharide.  
(c) Protein. (d) Water.
4. Which of the following is an example of a reducing sugar ?  
(a) Glucose. (b) Sucrose.  
(c) Lactose. (d) Maltose.
5. Which of the following is NOT a function of carbohydrates in living organisms ?  
(a) Energy storage. (b) Structural support.  
(c) Cell signaling. (d) Regulation of body temperature.
6. What is the primary function of the citric acid cycle in cellular respiration ?  
(a) Production of ATP.  
(b) Oxidation of glucose.  
(c) Reduction of NAD<sup>+</sup> to NADH.  
(d) Generation of electron carriers.

**Turn over**

7. Which of the following is NOT a function of the electron transport chain in cellular respiration ?
- (a) Production of ATP.
  - (b) Generation of a proton gradient.
  - (c) Oxidation of NADH and FADH<sub>2</sub>.
  - (d) Conversion of pyruvate to acetyl-CoA.
8. Which amino acid is commonly found in nuts and seeds ?
- (a) Lysine.
  - (b) Methionine.
  - (c) Leucine.
  - (d) Phenylalanine.
9. Which amino acid is the most abundant in the body ?
- (a) Alanine.
  - (b) Glutamine.
  - (c) Asparagine.
  - (d) Leucine.
10. Which disaccharide is commonly used in the pharmaceutical industry as a tablet excipient ?
- (a) Lactose.
  - (b) Maltose.
  - (c) Sucrose.
  - (d) Galactose.
11. Which of the following diseases is associated with improper disulfide bond formation ?
- (a) Alzheimer's disease.
  - (b) Parkinson's disease.
  - (c) Cystic fibrosis.
  - (d) Diabetes mellitus.
12. Omega-3 fatty acids are classified as :
- (a) Saturated fatty acids.
  - (b) Monounsaturated fatty acids.
  - (c) Polyunsaturated fatty acids.
  - (d) Trans fatty acids.
13. What is the primary greenhouse gas emitted from human activities that influences the water cycle ?
- (a) Carbon dioxide (CO<sub>2</sub>).
  - (b) Methane (CH<sub>4</sub>).
  - (c) Nitrous oxide (N<sub>2</sub>O).
  - (d) Water vapor (H<sub>2</sub>O).

14. In addition to carbon dioxide, what other greenhouse gas is released during the combustion of fossil fuels ?
- (a) Methane. (b) Nitrous oxide.  
(c) Water vapor. (d) Sulfur dioxide.
15. The electron transport chain is located in the :
- (a) Cytoplasm.  
(b) Mitochondrial matrix.  
(c) Inner mitochondrial membrane.  
(d) Endoplasmic reticulum.
16. What is the approximate concentration of carbon dioxide in Earth's atmosphere ?
- (a) 0.03 %. (b) 0.3 %.  
(c) 3 %. (d) 30 %.
17. Which of the following is a symptom of hypercalcemia ?
- (a) Weakness. (b) Bone pain.  
(c) Nausea. (d) Muscle twitching.
18. Which type of chlorophyll is primarily found in algae ?
- (a) Chlorophyll a. (b) Chlorophyll b.  
(c) Chlorophyll c (d) Chlorophyll d
19. Which type of chlorophyll is predominantly found in plants ?
- (a) Chlorophyll a. (b) Chlorophyll b.  
(c) Chlorophyll c. (d) Chlorophyll d.
20. What is the name of the structure that surrounds and protects developing fern sporangia ?
- (a) Sorus. (b) Indusium.  
(c) Strobilus. (d) Sporophyll.
21. Which of the following is not a type of RNA polymerase in eukaryotes ?
- (a) RNA polymerase I. (b) RNA polymerase II.  
(c) RNA polymerase III. (d) RNA polymerase IV.

Turn over

22. Which of the following factors is not involved in transcriptional regulation through chromatin remodeling ?
- (a) Histone acetyltransferases (HATs).
  - (b) DNA methyltransferases.
  - (c) Histone deacetylases (HDACs).
  - (d) SWI/SNF complexes.
23. Which subunit of RNA polymerase II contains the catalytic activity responsible for RNA synthesis ?
- (a) Rpb1.
  - (b) Rpb2.
  - (c) Rpb3.
  - (d) Rpb4.
24. The phenotype of an organism is determined by its :
- (a) Genotype.
  - (b) Environment.
  - (c) Both genotype and environment.
  - (d) Neither genotype nor environment.
25. What is the approximate diameter of the B DNA helix ?
- (a) 1 nanometer.
  - (b) 2 nanometers.
  - (c) 3 nanometers.
  - (d) 4 nanometers.
26. What is the typical tilt angle between adjacent base pairs in Z DNA ?
- (a) 0 degrees.
  - (b) 45 degrees.
  - (c) 60 degrees.
  - (d) 90 degrees.
27. Which of the following DNA repair mechanisms is involved in repairing thymine dimers caused by UV radiation ?
- (a) Base excision repair.
  - (b) Nucleotide excision repair.
  - (c) Mismatch repair.
  - (d) Homologous recombination.

28. Which of the following genetic disorders is caused by a mutation in a mitochondrial gene ?
- (a) Cystic fibrosis.
  - (b) Duchenne muscular dystrophy.
  - (c) Leber's hereditary optic neuropathy.
  - (d) Tay-Sachs disease.
29. Which taxonomic category is the broadest ?
- (a) Species.
  - (b) Genus.
  - (c) Family.
  - (d) Kingdom.
30. What is the correct order of taxonomic categories from broadest to most specific ?
- (a) Kingdom, Phylum, Class, Order, Family, Genus, Species.
  - (b) Kingdom, Class, Phylum, Order, Family, Genus, Species.
  - (c) Phylum, Kingdom, Order, Class, Family, Genus, Species.
  - (d) Kingdom, Phylum, Order, Class, Family, Species, Genus.
31. Which of the following is a characteristic of an r-selected species ?
- (a) Long lifespan.
  - (b) High reproductive investment.
  - (c) Late reproductive age.
  - (d) Stable population size.
32. In which ecosystem is primary succession most likely to occur ?
- (a) Desert.
  - (b) Tundra.
  - (c) Grassland.
  - (d) Temperate forest.
33. What term describes the sequence of communities observed during succession ?
- (a) Biome shift.
  - (b) Ecological reversal.
  - (c) Climax progression.
  - (d) Seres.
34. Which of the following is a greenhouse gas that is naturally present in the atmosphere ?
- (a) Carbon monoxide.
  - (b) Methane.
  - (c) Sulfur dioxide.
  - (d) Nitrogen oxides.

35. What is the largest class of fish ?
- (a) Chondrichthyes. (b) Osteichthyes.  
(c) Agnatha. (d) Amphibia.
36. Which of the following is not a primary factor affecting soil formation ?
- (a) Parent material. (b) Climate.  
(c) Topography. (d) Crop rotation.
37. Which agricultural practice involves tilling the land to bury crop residues and enhance soil fertility ?
- (a) No-till farming. (b) Conservation tillage.  
(c) Strip-till farming. (d) Conventional tillage.
38. What is the purpose of a condenser in a microscope ?
- (a) To focus light onto the specimen.  
(b) To magnify the specimen.  
(c) To control the intensity of light.  
(d) To adjust the resolution of the image.
39. In fluorescence microscopy, what causes the fluorescent molecules in the specimen to emit light ?
- (a) Absorption of photons. (b) Reflection of photons.  
(c) Scattering of photons. (d) Excitation by photons.
40. Which of the following is a major greenhouse gas that is primarily released through agricultural activities ?
- (a) Carbon dioxide ( $\text{CO}_2$ ). (b) Methane ( $\text{CH}_4$ ).  
(c) Nitrous oxide ( $\text{N}_2\text{O}$ ). (d) Ozone ( $\text{O}_3$ ).
41. Which group of herbicides inhibits the enzyme protoporphyrinogen oxidase (PPO) ?
- (a) Group 2. (b) Group 4.  
(c) Group 9. (d) Group 14.
42. What is the energy source utilized by DNA ligase to catalyze the joining of DNA fragments ?
- (a) ATP. (b) GTP.  
(c) UTP. (d) CTP.

43. Which type of collagen is most abundant in the human body ?
- (a) Type I. (b) Type II.  
(c) Type III. (d) Type IV.
44. What happens to the  $K_m$  value of an enzyme in non-competitive inhibition ?
- (a)  $K_m$  increases. (b)  $K_m$  decreases.  
(c)  $K_m$  remains unchanged. (d)  $K_m$  becomes negative.
45. Which bacterial structure is responsible for attaching bacteria to surfaces and protecting them from desiccation and antibiotics ?
- (a) Capsule. (b) Flagellum.  
(c) Pili. (d) Glycocalyx.
46. Which type of antibody is known for having a longer hinge region, contributing to its flexibility ?
- (a) IgA. (b) IgD.  
(c) IgE. (d) IgG.
47. What is the term used to describe the process of introducing foreign DNA into the genome of an animal ?
- (a) Genetic engineering. (b) Gene splicing.  
(c) Gene therapy. (d) Transgenesis.
48. Which insect order includes species that undergo incomplete metamorphosis ?
- (a) Diptera. (b) Hymenoptera.  
(c) Orthoptera. (d) Hemiptera.
49. What is the typical composition of biogas ?
- (a) 50 % methane, 50 % carbon dioxide.  
(b) 70 % methane, 30 % carbon dioxide.  
(c) 80 % methane, 20 % carbon dioxide.  
(d) 90 % methane, 10 % carbon dioxide.
50. Which of the following diseases has been successfully treated using stem cell therapy medical biotechnology ?
- (a) Alzheimer's disease. (b) Cystic fibrosis.  
(c) Diabetes mellitus. (d) Tuberculosis.