EPITOME MODEL ISLAMIC SCHOOLS

BIOLOGY INTERVIEW QUESTIONS

Instruction: Attempt all questions from this section

Time Allowed for this section: 20 minutes

SECTION A: MCQ

1. The fluid mosaic model of the plasma membrane was proposed by: A) Singer and Nicolson B) Watson and Crick C) Schleiden and Schwann D) Virchow
2. In prokaryotic cells, the site of protein synthesis is: A) Nucleus B) Ribosomes in cytoplasm C) Mitochondria D) Endoplasmic reticulum
3. During mitosis, the phase where chromosomes align at the metaphase plate is: A) Prophase B) Metaphase C) Anaphase D) Telophase
4. The powerhouse of the cell, mitochondria, has its own DNA which is: A) Circular and maternal B) Linear and paternal C) Circular and biparental D) Linear and maternal
5. Lysosomes are involved in: A) Photosynthesis B) Intracellular digestion C) ATP production D) Protein synthesis
6. The endosymbiotic theory explains the origin of: A) Nucleus B) Chloroplasts and mitochondria C) Cell wall D) Plasma membrane
7. In osmosis, water moves from a region of: A) High solute to low solute concentration B) Low solute to high solute concentration C) Equal solute concentration D) High pressure to low pressure
8. The Golgi apparatus primarily functions in: A) Lipid synthesis B) Packaging and modification of proteins C) DNA replication D) Carbohydrate storage
9. The central dogma of molecular biology states that genetic information flows from: A) DNA → RNA → Protein B) Protein → RNA → DNA C) RNA → DNA → Protein D) Protein → DNA → RNA
10. In a dihybrid cross (AaBb × AaBb), the phenotypic ratio in F2 generation is: A) 9:3:3:1 B) 1:2:1 C) 3:1 D) 1:1:1:1
11. Sickle cell anemia is an example of: A) Codominance B) Incomplete dominance C) Pleiotropy D) Multiple alleles
12. Restriction enzymes are used in recombinant DNA technology to: A) Synthesize proteins B) Cut DNA at specific sequences C) Amplify DNA (PCR) D) Sequence DNA
13. The lac operon in E. coli is an example of: A) Inducible negative regulation B) Repressible positive regulation C) Constitutive expression D) Post-transcriptional control
14. During DNA replication, the enzyme that joins Okazaki fragments is: A) DNA polymerase III B) Helicase C) Ligase D) Primase
15. Mutations caused by intercalating agents like ethidium bromide lead to: A) Base substitutions B) Frameshift mutations C) Deletions D) Transitions only
16. In pedigree analysis, a trait showing X-linked recessive inheritance is more common in: A) Females B) Males C) Equal in both D) Depends on environment
17. Darwin's theory of natural selection is based on: A) Inheritance of acquired characteristics B) Variation, overproduction, and survival of the fittest C) Use and disuse of organs D) Germplasm theory
18. The Hardy-Weinberg equilibrium assumes: A) No mutation, no migration, infinite population size B) Small population with frequent mating C) High mutation rate D) Directional selection

19. Homologous structures in different species indicate: A) Convergent evolution B) Divergent evolution C) Parallel evolution D) Coevolution
20. The fossil record provides evidence for evolution through: A) Transitional forms B) Absolute dating only C) Modern distributions D) Molecular clocks
21. Genetic drift is most significant in: A) Large populations B) Small populations (founder effect) C) Stabilizing selection D) Disruptive selection
22. The Miller-Urey experiment simulated conditions to demonstrate: A) Origin of life from inorganic molecules B) Photosynthesis in early Earth C) Evolution of eukaryotes D) Speciation events
23. In an ecosystem, the trophic level with the least biomass is typically: A) Producers B) Primary consumers C) Secondary consumers D) Top carnivores
24. The greenhouse effect is primarily caused by: A) CO_2 and water vapor trapping infrared radiation B) Ozone depletion C) Acid rain D) Eutrophication
25. Succession starting on bare rock is: A) Primary succession B) Secondary succession C) Cyclic succession D) Autogenic succession only
26. Biomagnification of DDT affects: A) Producers most B) Top predators most C) Decomposers D) All equally
27. The carrying capacity (K) in logistic growth model represents: A) Maximum population size environment can sustain B) Initial population growth rate C) Exponential growth phase D) Death rate
28. The hormone responsible for fight-or-flight response is: A) Insulin B) Adrenaline C) Thyroxine D) Estrogen
29. In the nephron, the site of reabsorption of glucose and amino acids is: A) Bowman's capsule B) Proximal convoluted tubule C) Loop of Henle D) Distal convoluted tubule
30. The pacemaker of the heart is: A) AV node B) SA node C) Purkinje fibers D) Bundle of His
31. In humans, the ABO blood group is determined by: A) Multiple alleles with codominance B) Single gene with complete dominance C) Sex-linked inheritance D) Polygenic inheritance
32. Phototropism in plants is mediated by: A) Gibberellins B) Auxin (IAA) redistribution C) Cytokinins D) Abscisic acid
33. The Calvin cycle in photosynthesis occurs in the: A) Stroma of chloroplast B) Thylakoid membrane C) Cytoplasm D) Mitochondria
34. Double circulation in humans ensures: A) Separation of oxygenated and deoxygenated blood B) Mixing of blood in heart C) Low pressure in pulmonary circuit only D) Single ventricle
35. The role of chlorophyll in photosynthesis is to: A) Absorb light energy B) Fix CO_2 C) Produce ATP D) Split water
36. Gram-positive bacteria retain the stain due to: A) Thick peptidoglycan layer B) Thin cell wall C) Lipid content D) Capsule presence
37. In vaccination, the principle used is: A) Active acquired immunity B) Passive immunity C) Innate immunity D) Autoimmunity
38. Plasmids are used as vectors in genetic engineering because they: A) Replicate independently and carry foreign DNA B) Are linear chromosomes C) Cannot be cut by enzymes D) Are essential for host survival

39. The process of nitrogen fixation is carried out by: A) Rhizobium bacteria in root nodules B) Fungi in mycorrhizae C) Algae in lichens D) Protozoa
40. PCR (Polymerase Chain Reaction) amplifies DNA by repeated cycles of: A) Denaturation, annealing, extension B) Ligation, transcription, translation C) Restriction, insertion, transformation D) Hybridization, sequencing, cloning