

Model Question paper

MSc Biosciences

Max marks: 75

Time: 2 hours

SAMPLE QUESTIONS

Section – A (Objective Type) 25 marks

01. The general chemical formula of carbohydrate is
 - a. $(\text{CH}_2\text{O})_n$
 - b. $(\text{CH}_2\text{O})_{2n}$
 - c. $(\text{CHO})_n$
 - d. $\text{C}_n\text{H}_{2n}\text{O}$

02. Fat storing cells of vertebrates are called
 - a. Hepatocytes
 - b. Asterocytes
 - c. Adipocytes
 - d. Melanocytes

03. Which of the following cellular event is NOT directly involved with mitochondria?
 - a. Apoptosis
 - b. ATP synthesis
 - c. Controlling cell cycle
 - d. Protein degradation

04. The dye used in gram staining is
 - a. Methylene blue
 - b. Giemsa
 - c. Rhodamine
 - d. Crystal violet

05. Kranz anatomy is seen in
 - a. all monocots
 - b. monocots with C₄ pathway
 - c. monocots and dicots with C₃ pathway
 - d. legumes

06. Which pump is responsible for initiating muscle contraction through depolarization of muscle cell membrane?

1. Na⁺ pump.
2. K⁺ pump.
3. Ca²⁺ pump.
4. Mg²⁺ pump.

07. Chirality of DNA is due to

- a. The bases
- b. Base stacking
- c. Hydrogen bond between bases
- d. Deoxyribose

08. Reaction products inhibit catalysis in enzymes by

- a. Covalently binding to the enzyme
- b. Altering the enzyme structure
- c. Occupying the active site
- d. Form a complex with substrate

09. Proton Motive Force during oxidative phosphorylation is generated in mitochondria by

- a. exchanging protons for sodium ions
- b. Pumping protons out into intermembrane space
- c. pumping hydroxyl ions into the mitochondria
- d. Hydrolysis of ATP

10. In nature, *Agrobacterium tumefaciens* mediated infection of plant cells leads to

- P. crown gall disease in plants
- Q. hairy root disease in plants
- R. transfer of T-DNA into the plant chromosome
- S. transfer of Ri-plasmid into the plant cell

(A) S only (B) P and R only (C) Q and S only (D) Q only

11. The hormone which can replace vernalization:

- a. Cytokinin
- b. Auxin
- c. Ethylene
- d. Gibberellins

12. Genetic Drift is caused on account of:

- a. variation
- b. Mutation
- c. Increase in population
- d. Decrease in population

13. Histones are rich in.

- a. Lysine
- b. Arginine
- c. Histidine
- d. Lysine and Arginine

14. Origin of species was proposed by

- a. Lamark
- b. Oparin
- c. Weismann
- d. Darwin

15. Which of the following is a living fossil

- a. Cycas
- b. Moss
- c. Spirogyra
- d. Saccharomycetes

16. The significance of the plasma membrane is that

- a. it selectively allows some molecules to pass into the organism
- b. it prevents movement of molecules out of the organism
- c. it is the site of protein synthesis
- d. All of above

17. What is a plasmid?

- a. Self-replicating segment of double stranded DNA
- b. segment of single stranded RNA
- c. A bacterial chromosome
- d. None of the Above

18. A bacillus bacterium with a single flagellum at each end is described as

- a. Monotrichous
- b. Amphitrichous
- c. Lophotrichous
- d. Peritrichous

19. The gram-positive bacteria lack _____ structure/component?

- a. outer membrane
- b. murein
- c. teichoic acid
- d. plasma membrane

20. Among the 20 standard proteins coding amino acids, which one is least occurs in proteins?

- a. Glycine
- b. Alanine
- c. Tryptophan
- d. Methionine

21. Cellular organelle(s) involved in the regulation of Ca^{2+} level in the cell _____.

- a. Mitochondria
- b. Endoplasmic Reticulum
- c. Endoplasmic Reticulum and Mitochondria
- d. Mitochondria and vesicles.

22. The reptilian order Squamata includes

- 1. crocodiles and alligators.
- 2. the living fossil 'tuatara'.
- 3. turtles and tortoises.
- 4. snakes and lizards.

23. Which of the following bonds will be most difficult to break?

- a. C–O
- b. C–C
- c. C–N
- d. C–S

24. Which of the following is a mobile electron carrier in the mitochondrial electron transport system?

- a. NADH dehydrogenase
- b. FADH Dehydrogenase
- c. Ubiquinone
- d. Succinate dehydrogenase

25. The only enzyme in citric acid cycle (Kreb's cycle) which is attached to the inner mitochondrial membrane is:

- a. Succinate dehydrogenase
- b. NADPH dehydrogenase
- c. Isocitrate dehydrogenase
- d. Malate dehydrogenase

Section – B (Short Answer Type Questions) 30 marks

- 1) Economic Importance of bacteria
- 2) Economic Importance of family Brassicaceae
- 3) Comment on endosperm
- 4) Explain briefly about types of Meristematic tissue
- 5) Comment on osmosis
- 6) Write short notes on General Characters of protozoa
- 7) Comment on Sericulture
- 8) Write short notes on Mendel's laws of Inheritance

Section – C (Long Answer Type Questions) 20 marks

- 1) Elaborate on Flight Adaptations in Birds
- 2) Discuss in detail about Muscle Contraction

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