

B.Sc. Semester - 3 (CBCS) Examination
Oct/Nov - 2024 [As Per Syllabus Year June-2019]
BioTechnology-BT301(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A)	Answer the following. (Any one Out of Two)	(07)
	1. Discuss the different catalytic mechanisms utilized by enzymes. 2. Describe the Nomenclature and Classification of enzyme.	
Que.1(B)	Attempt any one. (Out of Two)	(04)
	1. Briefly explain the role of coenzymes and cofactors in enzyme function. 2. What is the significance of the Michaelis constant (K_m) in enzyme kinetics?	
Que.1(C)	Attempt any three. (Out of Five)	(03)
	1. The _____ model describes the enzyme-substrate interaction where the enzyme changes shape upon substrate binding. 2. _____ is an example of a reversible enzyme inhibitor that competes with the substrate for the active site. 3. Allosteric enzymes follow Michaelis-Menten kinetics without any deviations. (True/False) 4. What is the term for enzymes that catalyze the same reaction but have different amino acid sequences? 5. Name the graphical method used to linearize the Michaelis-Menten equation.	
Que.2(A)	Answer the following. (Any one Out of two)	(07)
	1. Outline the key steps of the TCA cycle, including the main products generated at each stage. 2. Describe the process of oxidative phosphorylation.	
Que.2(B)	Attempt any one. (Out of two)	(04)
	1. Briefly describe the role of β-oxidation in lipid metabolism. 2. Explain how gluconeogenesis differs from glycolysis in terms of function and location.	
Que.2(C)	Attempt any three. (Out of Five)	(03)
	1. The end product of glycolysis under anaerobic conditions in muscles is ____. 2. The enzyme _____ converts pyruvate to acetyl-CoA, linking glycolysis to the TCA cycle. 3. The TCA cycle occurs in the cytoplasm of eukaryotic cells. (True/False) 4. What is the primary purpose of the hexose monophosphate (HMP) shunt in carbohydrate metabolism? 5. Name the final electron acceptor in the electron transport chain (ETC).	
Que.3(A)	Answer the following. (Any one Out of two)	(07)
	1. Explain the urea cycle, outlining the main steps and its importance in nitrogen metabolism. 2. Describe the process of photosynthesis, including the light-dependent and light-independent reactions.	
Que.3(B)	Attempt any one. (Out of two)	(04)
	1. Briefly describe the role of deamination in amino acid metabolism. 2. What is an inborn error of metabolism? Provide one example.	

- Que.3(C) Attempt any three. (Out of Five) (03)
1. The process of removing an amino group from an amino acid to form ammonia is called _____.
 2. In the urea cycle, the compound _____ is converted into urea and excreted by the kidneys.
 3. Transamination involves the transfer of an amino group from one amino acid to a keto acid. (True/False)
 4. Which enzyme catalyzes the first step of the urea cycle?
 5. Name the pigment responsible for capturing light energy during photosynthesis.
- Que.4(A) Answer the following. (Any one Out of two) (07)
1. Explain the effects of hormonal imbalances in humans.
 2. Discuss the different types of animal hormones.
- Que.4(B) Attempt any one. (Out of two) (04)
1. Briefly describe the difference between endocrine and exocrine glands.
 2. What role do auxins play in plant growth and development?
- Que.4(C) Attempt any three. (Out of Five) (03)
1. The hormone _____ is responsible for regulating blood glucose levels by promoting the uptake of glucose into cells.
 2. _____ is a plant hormone that plays a crucial role in seed germination and stem elongation.
 3. Endocrine glands release hormones directly into the bloodstream, while exocrine glands secrete their products through ducts. (True/False)
 4. What is the primary function of the hormone insulin?
 5. Name one disorder caused by the overproduction of thyroid hormone in humans.
- Que.5(A) Answer the following. (Any one Out of two) (07)
1. Explain the components and process of a signal transduction cascade.
 2. Describe the composition and architecture of the cell membrane.
- Que.5(B) Attempt any one. (Out of two) (04)
1. Briefly describe the difference between active and passive transport mechanisms across the cell membrane.
 2. What role does protein kinase play in the regulation of the cell cycle?
- Que.5(C) Attempt any three. (Out of Five) (03)
1. The _____ model describes the fluid-like nature of the cell membrane, where lipids and proteins can move laterally.
 2. _____ are membrane proteins that assist in the facilitated diffusion of specific solutes across the membrane.
 3. Signal transduction cascades involve a series of phosphorylation events that amplify the original signal within the cell. (True/False)
 4. What is the primary function of ATPases in membrane transport?
 5. Name the protein complex involved in regulating the cell cycle at checkpoints.
