

Seat No. : _____

AG-128

April-2025

B.Sc., Sem.-VI

SEC-311 : Biotechnology (Metabolism and Endocrinology)

Time : 2:30 Hours]

[Max. Marks : 70

1. Explain the Tricarboxylic Acid (TCA) Cycle in detail. Describe each step with the enzymes involved, intermediates formed, and the energy yield. Also, discuss the significance of the cycle in cellular metabolism. **14**

OR

1. (A) Write a note on beta oxidation of saturated fatty acids. **7**
(B) Describe the process of Glycolysis in detail. **7**
2. Describe the Urea Cycle in detail. Include the location, steps involved, key enzymes, intermediates, the role of ATP, and the significance of the cycle in nitrogen metabolism. **14**

OR

2. (A) Describe the process of purine nucleotide degradation. **7**
(B) Explain the processes of deamination, transamination, and decarboxylation of amino acids. **7**
3. Describe in detail : Hormone classification based on type of receptor. Describe the hormones with intracellular receptors and their mode of action. **14**

OR

3. (A) Write the differences between Class I and Class II hormones. **7**
(B) Describe positive feedback regulation of hormones with example. **7**
4. Describe the biosynthesis, secretion, transport, and regulation of pancreatic hormones. Discuss the biological actions of insulin and glucagon and their roles in maintaining blood glucose homeostasis. **14**

OR

4. (A) Explain the biosynthesis, secretion, transport, and regulation of hormones produced by the hypothalamus. **7**
(B) Explain the biosynthesis, storage and release of thyroid hormones. **7**

5. Attempt any **seven** questions (2 Mark each) :

14

- (1) Write the full form of PPP.
 - (2) Where does glycolysis occur in the cell ?
 - (3) Which process shares the same pathway as glycolysis but in the opposite direction ?
 - (4) What is deamination ?
 - (5) What is transamination ?
 - (6) What is decarboxylation ?
 - (7) Which enzyme produces phosphatidylinositol ?
 - (8) What is the role of pancreatic insulin in glucose homeostasis ?
 - (9) Give an example of a steroid hormone.
 - (10) What is the function of thyroid hormones ?
 - (11) Which glands produce the hormone oxytocin ?
 - (12) Write the Full form of POMC.
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