

- (b) What is a second messenger? Why do you suppose it is called this? Elucidate the role of calcium-binding proteins eliciting a response. $2+2+6=10$
- (c) Distinguish between aerobic respiration and anaerobic respiration. Explain the significance of oxygen in aerobic respiration in the context of ETS. $3+7=10$
- (d) Describe the β -oxidation pathway of fatty acid degradation. Draw the glyoxylate cycle. $6+4=10$
- (e) Why do you suppose RuBisCO performs more carboxylation in C4 plants than in other plants? Explain the Hatch and Slack pathways with proper schematic sketch. $4+6=10$
- (f) What are mono, oligo and polysaccharides? Describe their role in plant metabolism. $3+7=10$

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : $1 \times 7 = 7$
- (a) Name the type of the metabolic pathway which is involved in the synthesis of compounds in plant bodies.
- (b) What is the first stable product in the C4 pathway?
- (c) Which of the given lights are strongly absorbed by plants?
- (f) Indigo and Yellow

- (ii) Yellow and Violet
- (iii) Blue and Red
- (iv) Orange and Violet

- (d) Name the enzyme which catalyses the conversion of N_2 into ammonia during the biological N_2 fixing process.
- (e) Name one simple lipid.
- (f) Which enzyme is required for the synthesis of ATP?
- (g) The end product of glycolysis under anaerobic conditions is _____ (Fill in the blank)

2. Answer the following questions shortly :

$2 \times 4 = 8$

- (a) Write the roles of PS-II during photosynthesis.
- (b) Write a note on ATP as high energy molecule.
- (c) Define aerobic respiration.
- (d) Distinguish between RuBP and RuBisCO.

3. Answer the following questions briefly : (any three)

$5 \times 3 = 15$

- (a) Explain Glycolysis. State its end products. In both aerobic and anaerobic respiration, determine the fate of these products.
- (b) Discuss the key events and outcomes of the light reaction of photosynthesis.
- (c) Discuss different types of nitrogen-fixing bacteria and their symbiotic relationships with plants.
- (d) Explain the mechanisms of enzyme inhibition with suitable example.
- (e) What is meant by the term 'signal transduction'? What are some of the steps by which signal transduction can occur?

4. Answer the following questions as instructed :

(any three) $10 \times 3 = 30$

- (a) Explain how the irreversible reaction catalysed by the pyruvate dehydrogenase complex leads to the entry of acetyl-CoA into the TCA cycle. Why cannot acetyl-CoA be used as a substrate for gluconeogenesis? $4+6=10$