2023

BOTANY — HONOURS

Paper : CC-14

(Plant Metabolism)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer ***any five*** questions : 2×5
   (a) Why is oxidative pentose phosphate pathway called a shunt pathway?
   (b) Define isozyme citing one example.
   (c) What is 'CAM-idling'?
   (d) Explain the amphibolic role of TCA cycle.
   (e) Explain the significance of Gluconeogenesis.
   (f) Write down the reaction of TCA cycle which requires FAD.
   (g) How Serine is formed from Glycine during photorespiration?
   (h) Distinguish between absorption spectrum and action spectrum.

2. Answer ***any two*** questions :
   (a) What is the location of Glyoxylate cycle? Write the reactions of the glyoxylate cycle. 1+4
   (b) Mention the steps involved in conversion of Pyruvic acid to Acetyl CoA. 5
   (c) How many ATP molecules will be produced after complete oxidation of a molecule of C-18 Fatty acid? Justify your answer. 5

3. Answer ***any three*** questions :
   (a) What do you mean by preparatory and pay off phases of EMP pathway? Mention the regulation of this pathway. Write down three irreversible reactions taking place during this pathway mentioning the names of enzymes at each step. 2+5+3
   (b) Describe in brief the structural organization of enzyme nitrogenase. Highlight the role of Leghaemoglobin in biological nitrogen fixation. How can ammonium be converted into amino acid by GS/GOGAT enzyme system in plants? 3+3+4
   (c) Discuss the role of calcium-calmodulin in signal transduction. What is the function of MAP-Kinase cascade in signalling? 5+5
   (d) What are the sites and enzymes of the primary and secondary carboxylation reactions in C_4 plants? Enumerate the variations in decarboxylation mechanism of C_4 plants with examples. 4+6
   (e) Write notes on : 5×2
      (i) Biological significances of carotenoid pigments
      (ii) Water splitting mechanism during photosynthesis.
