3 (Sem–6/CBCS) BOT HC 1

2025

BOTANY

(Honours Core)

Paper : BOT–HC–6016

(Plant Metabolism)

Full Marks : 60

Time : Three hours

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

1. Answer the following questions : 1×7=7

   (a) What is the light wavelength for conversion of physiologically active form of phytochrome to inactive form ?

   (b) Name the metal present in the chlorophyll molecule associated with photosynthesis.

   (c) What is the name of the protein part of enzyme ?

(d) Which molecule acts as reaction centres in photosynthesis ?

(e) In which part of the mitochondria ATP synthesis occurs ?

(f) Name of a coenzyme which is a carrier of acyl group.

(g) Write the name of the micronutrient which is the constituent of nitrate reductase ?

2. Answer the following questions shortly : 2×4=8

(a) Differentiate between C4 and C3 pathways.

(b) Explain quantum and photon of light energy.

(c) Define oxidative phosphorylation.

(d) Significance of Photorespiration.

3. Answer the following questions briefly : ***(any three)*** 5×3=15

(a) Describe the Chemiosmotic theory of ATP synthesis.

(b) List the *three* phases of photosynthesis. Briefly discuss the chemical steps in these phases.

(c) Explain briefly the cyanide-resistant respiration.

(d) What are coenzymes and isoenzymes ? Give an account of *two* important coenzymes involved in respiration.

(e) How blue-green algae fix atmospheric nitrogen ? Describe the mechanism of nitrogen fixation by BGA.

4. Answer the following questions as instructed : ***(any three)*** 10×3=30

(a) What is a CAM ? Discuss the CAM pathway. Write about the significance of CAM. 2+6+2=10

(b) Elaborate the process of biological nitrogen fixation in legumes and non-legumes, with special reference to biochemistry of the process.

(c) What are lipids ? Describe the role in Mobilization of Lipids during oily seed germination. 2+8=10

(d) What is fermentation ? Write briefly the mechanism of alcoholic fermentation. Mention the relation between fermentation and anaerobic respiration.
1+7+2=10

(e) What are enzymes ? Describe the classification and nomenclature of enzymes with appropriate examples.
2+8=10

(f) What are phospholipids and glycolipids ? Name some of the important phospholipids in plants. How the phospholipids are synthesized ?
2+3+5=10