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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 :

$$2 \times 4 = 8$$

- (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)

$$5 \times 3 = 15$$

- (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)** $10 \times 3 = 30$

- (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