

Roll No.

Total Pages : 03

CMDQ/D-23

6549

PLANT BIOCHEMISTRY

BCH-303

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. Briefly discuss the following : **8×2=16**

- (a) Ammonia assimilation
- (b) Give *two* examples of auxins
- (c) Requirement of an antenna to capture light
- (d) Van Neil equation
- (e) Role of leghaemoglobin in nitrogen fixation
- (f) Phytochromes as light sensors
- (g) Photophosphorylation
- (h) Write the name and the reaction catalyzed by the enzyme that initially fixes CO₂ in C₄ plants.

Section A

2. Discuss the following in detail : **6+5+5=16**

- (a) Regulation of energy distribution between Photosystem I and Photosystem II

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- (b) Proteins and water as higher plant cell wall constituents
- (c) Inhibitors of non-cyclic electron transport.
- 3. (a) Discuss in detail the binding change mechanism of ATP synthesis. **6**
- (b) Write notes on the following : **6+4=10**
 - (i) Electron transport in purple photosynthetic bacterium
 - (ii) Red drop and Emerson enhancement effect.

Section B

- 4. (a) Describe the biosynthesis and regulation of starch in the chloroplasts of higher plants. **8**
- (b) Briefly discuss the cyanide resistant respiratory pathway. **5**
- (c) Write a short note on Kranz anatomy. **3**
- 5. Discuss the following : **7+5+4=16**
 - (a) Regulation of C₄ Cycle enzymes
 - (b) Assimilation of CO₂ in CAM plants
 - (c) Structure and function of Rubisco.

Section C

- 6. (a) Describe the structure and function of nitrate and nitrite reductases. **8**
- (b) Discuss in detail about how the expression of *nif* genes of *Klebsiella pneumoniae* are regulated ? **8**

- 7. (a) How is sulphate assimilated into cysteine in higher plants ? **8**
- (b) What is Nitrogenase ? Discuss the various strategies for the protection of nitrogenase against the inhibitory effect of oxygen. **8**

Section D

- 8. (a) Explain the developmental and physiological effects of ethylene. Also briefly discuss the biosynthesis of ethylene. **8**
- (b) Describe the molecular mechanism of action of gibberellins by which they induce α-amylase synthesis in barley aleurone layers. **8**
- 9. (a) Discuss the molecular mechanism of action of cytokinins. **8**
- (b) Describe the roles of PR proteins and nitric oxide in plant defense against pathogens. **8**