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S. No. of Question Paper : 761

Unique Paper Code : 216601

E

Name of the Paper : Plant Metabolism and Biochemistry (BTHT-610)

Name of the Course : B.Sc. (Hons.) Botany

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *five* questions in all including

Question No. 1 which is compulsory.

1. (a) Give contributions of the following :

5×1

(i) Peter Mitchell

(ii) J. Sumner

(iii) E. Racker

(iv) Otto Warburg

(v) R. Govindjee.

(b) Expand any *five* of the following :

5×½

(i) DCMU

(ii) SHAM

(iii) PEPCK

P.T.O.

- (iv) NADH
- (v) PDH
- (vi) PCR
- (c) Define the following : 5×1
- (i) Q₁₀
- (ii) Cofactors
- (iii) Nodulins
- (iv) Flavonoids
- (v) Anaplerotic Reactions.
- (d) Fill in the blanks : 5×½
- (i) ATPase activity in mitochondria is inhibited by
- (ii) Glycolysis is also known as
- (iii) An aquatic pteridophyte showing symbiotic association with cyanobacteria is
- (iv) The α 1-6 glycosidic linkage in starch is cleaved by the enzyme
- (v) Phosphatase belongs to class of enzymes.
2. Differentiate between any *three* of the following : 3×5
- (i) Reversible and Irreversible enzyme inhibition
- (ii) C₃ and CAM plants
- (iii) Aerobic and Anaerobic Respiration
- (iv) Glycolysis and Gluconeogenesis
- (v) Reductive amination and Transamination.

3. Comment upon any *three* of the following : 3×5
- (i) Oxidative Pentose Phosphate Pathway
 - (ii) Nitrogenase
 - (iii) Terpenoids
 - (iv) Regulatory Enzyme
 - (v) Kranz anatomy.
4. (a) Work out β -oxidation of a molecule of palmitic acid and give energetics of the pathway. 9
- (b) Write complete biochemical reactions catalyzed by any *three* of the following enzymes : 3×2
- (i) Cytochrome oxidase
 - (ii) GOGAT
 - (iii) Pyruvate kinase
 - (iv) Lactate dehydrogenase
 - (v) Isocitrate lyase.
5. (a) With the help of a schematic diagram explain the TCA cycle and work out its energetics for a molecule of glucose. 9
- (b) Give a brief account of factors affecting photosynthesis. 6

6. (a) Give a detailed account of the glyoxylate pathway. 9
- (b) Acetyl CoA is a hub of metabolic activity in the cell. Elaborate. 6

Or

Answer the following using chemical formulae (any two) : 2×3

- (i) Synthesis of a sucrose molecule.
- (ii) Substrate level phosphorylation for the synthesis of ATP molecule. (any one example)
- (iii) Show activation of a fatty acid molecule for β -oxidation.
- (iv) Synthesis of Asparagine from glutamine.
7. (a) Write an explanatory note on the role of secondary metabolites in plant defense. 9
- (b) Photorespiration is not a wasteful process. Justify. 6