

Total number of printed pages-4

3 (Sem-6/CBCS) BOT HC 1

2023

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 : $1 \times 7 = 7$
- (a) How many ATPs are consumed for synthesis of one hexose sugar in C3 cycle ?
 - (b) Name the cellular organelle where ATP synthetase works.
 - (c) MAP kinase are _____ proteins.
(Fill in the blank)
 - (d) Write *two* roles of uncouplers.

Contd.

(e) Metallic part of an enzyme is called _____.
(Fill in the blank)

(f) Name *one* enzyme responsible for transamination reaction.

(g) What is the cellular location of glycolysis?

2. Answer the following questions in brief :

2×4=8

(a) Discuss briefly about Bayer's conformational model on ATP synthesis.

(b) Distinguish between co-enzyme and co-factors.

(c) Discuss briefly about the process of transamination.

(d) What are the classes of enzymes according to the recent classification of IUB?

3. Write brief answer on *any three* of the following :

5×3=15

(a) Elucidate the role of temperature and $CO_2 : O_2$ ratio during photosynthetic CO_2 fixation.

- (b) Describe the systematic infection of root by *Rhizobium* bacteria during biological nitrogen fixation.
- (c) Illustrate the mechanisms of enzyme inhibition with proper examples.
- (d) Elucidate the process of formation of pyruvic acid during glycolysis.
- (e) Write shortly about antenna molecules and reaction centres involved in photosynthetic light reactions.

4. Answer **any three** from the following :

10×3=30

- (a) Elucidate with proper representation of reactions involved in the process of conversion of nitrate to ammonia. Write briefly about GS/GOGAT system.

7+3=10

- (b) Elucidate the role of calcium calmodulin cascade in signal transduction mechanism. What do you understand by receptor ligand interaction?

7+3=10

- (c) Describe the process of gluconeogenesis and its role in mobilisation of lipids during seed germination. What is α -oxidation? $7+3=10$
- (d) Elucidate with proper diagram the biosynthesis of ATP and $NAOPH_2$ involving PS-I and PS-II. What is the role of metalloproteins in photolysis of water? $7+3=10$
- (e) With proper representation of chemical reactions describe the TCA cycle. Discuss the energy balance of the process. $7+3=10$
- (f) Give a detailed account on synthesis and degradation of starch in plant body. $5+5=10$
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