

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