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3 (Sem-6/CBCS) BOT HC 1

2022

BOTANY

(Honours)

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 **any seven** questions from the following : $1 \times 7 = 7$
- (a) What are the *two* types of enzyme regulation ?
- (b) Name a cellular organelle containing cytochrome oxidase.
- (c) Cytochromes are _____ proteins.
(Fill in the blank)
- (d) What are accessory pigments ?

Contd.

- (e) Name a copper containing protein acting as an electron carrier in thylakoid membrane.
- (f) Why is TCA cycle amphibolic?
- (g) What are the types of second messengers?
- (h) Photorespiration is completed in _____, _____, and _____.
(Fill in the blanks)
- (i) Name the component of the enzyme nitrogenase.
- (j) Protein part of the enzyme is called as _____.
(Fill in the blank)

2. Answer **any four** questions from the following : 2×4=8

- (a) What do you mean by oxidative decarboxylation of pyruvate? Where does it occur?
- (b) What are the roles of uncouplers in ATP synthesis?
- (c) Distinguish between apoenzyme and prosthetic group.
- (d) Differentiate between RuBP and RUBISCO.

- (e) What regulates the PDH complex?
- (f) Photosynthesis is driven by two photochemical processes which are associated with two groups of photosynthetic pigments. Name them.
- (g) What is oxidative phosphorylation? Mention the *two* components of oxidative phosphorylation.
- (h) What is NADH shuttle? Name the *two* types of NADH shuttle.

3. Write short notes on **any three** of the following : 5×3=15

- (a) Crassulacean acid metabolism (ACM)
- (b) Synthesis and degradation of sucrose
- (c) Allosteric inhibition
- (d) Co-enzymes and co-factors
- (e) Cyanide-resistant respiration
- (f) Photorespiration
- (g) Biological nitrogen fixation
- (h) Receptor-ligand interactions

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

10×3=30

- (a) What is photophosphorylation? Give an account of cyclic and non-cyclic photophosphorylation.
 - (b) Describe the β -oxidation pathway of fatty acids.
 - (c) What are the fates of pyruvate in glycolysis? Explain briefly.
 - (d) Describe mitochondrial electron transport.
 - (e) What are enzymes? How are they classified? Give a brief account of classification and nomenclature of enzymes.
 - (f) What are second messengers? Mention the types of second messengers. Describe the mechanism of receptor mediated activation and inhibition of cyclic AMP.
 - (g) Describe C4 pathway and compare it with Calvin cycle.
 - (h) Explain glyoxylate cycle. What is its significance?
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