

KHAIRA COLLEGE KHAIRA, BALASORE

BOTANY QUESTION BANK

6TH SEMESTER

CORE COURSE XIII: PLANT METABOLISM

1. In the rainy season, doors get swelled up due to

- (a) Transpiration
- (b) Imbibition
- (c) Diffusion
- (d) Respiration

2. This statement regarding enzyme inhibition is correct

- (a) non-competitive inhibitors often bind to the enzyme irreversibly
- (b) non-competitive inhibition of an enzyme can be overcome by adding a large amount of substrate
- (c) competitive inhibition is observed when substrate and inhibitor compete for the active site on enzyme
- (d) competitive inhibition is observed when substrate competes with an enzyme to bind to an inhibitor protein

3. In C3 and C4 plants, primary carboxylation takes place with the help of

- (a) PEP carboxylase and pyruvate carboxylase
- (b) RuBP carboxylase and PEP carboxylase

- (c) PEP carboxylase and RuBP carboxylase
- (d) RuBP carboxylase and pyruvate carboxylase

4. Peroxisomes are involved in which type of reactions pertaining to plant photosynthesis?

- (a) Calvin Cycle
- (b) Glycolytic cycle
- (c) Glyoxylate cycle
- (d) Bacterial photosynthesis

5. The fundamental feature of Kranz Anatomy of C4 plants is

- (a) Presence of agranal chloroplasts in bundle sheath cells and granal chloroplasts in mesophyll cells
- (b) Presence of granal chloroplasts in bundle sheath cells and agranal chloroplasts in mesophyll cells
- (c) Presence of chloroplasts in epidermal and mesophyll cells
- (d) Presence of agranal chloroplasts in both mesophyll and bundle sheath cells

6. The statement which is incorrect with respect to enzyme action is

- (a) Addition of a lot of succinates does not reverse the inhibition of succinic dehydrogenase by malonate
- (b) the substrate binds with the enzyme as its active site
- (c) a non-competitive inhibitor binds the enzyme at a site distinct from that which binds the substrate

(d) malonate is a competitive inhibitor of succinic dehydrogenase

7. A phosphoglyceride is always composed of

(a) only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate

the group is also attached

(b) only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached

(c) an unsaturated or saturated fatty acid esterified to a phosphate molecule to which a

glycerol molecule is also attached

(d) an unsaturated or saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached

8. Macromolecule chitin is

(a) phosphorous containing polysaccharide

(b) nitrogen containing polysaccharide

(c) sulphur containing polysaccharide

(d) simple polysaccharide

9. This is a wrongly matched pair

(a) Alcohol – Nitrogenase

(b) Detergents – Lipase

(c) Textile – Amylase

(d) Fruit juice – Pectinase

10. The most abundant protein in the animal world is

(a) Trypsin

(b) Collagen

(c) Haemoglobin

(d) Insulin

Short questions:

1. Anabolic pathway
2. Catabolic pathway
3. Regulation of metabolism
4. Carbon assimilation
5. Photosynthetic pigments
6. Photorespiration
7. C4 pathway
8. CO₂ reduction
9. Photosynthetic electron transport
10. Carbohydrate metabolism
11. Glycolysis
12. Oxidative pentose phosphate pathway
13. ATP synthase
14. Oxidative phosphorylation
15. Substrate level phosphorylation
16. Mechanism of ATP synthesis

17. Lipid metabolism
18. Nitrate assimilation
19. Biological nitrogen fixation
20. Transamination
21. B-oxidation
22. Glyoxalate cycle

Long questions:

1. Describe the process of TCA cycle in detail with well labelled diagrams along with the enzymes in each step.
2. What is metabolism? What are its types? Discuss in detail.
3. Write a note on regulation of metabolism
4. What is carbon assimilation? Describe anabolic and catabolic pathways.
5. Give an introduction to photosynthetic pigments, their role with special reference to chlorophyll and accessory pigments.
6. Write the process of synthesis and catabolism of Sucrose or starch.
7. What are the various mechanisms of ATP synthesis? Explain.
8. Explain the process of biological nitrogen fixation in both legumes and non-legumes.
9. Discuss the physiology and biochemistry of nitrogen fixation.
10. What is CO₂ reduction? Explain.

11. Describe the process of β -oxidation pathway in plants. What is its significance?