

2021

BIOCHEMISTRY — HONOURS

Paper : DSE-B-1

(Advanced Biochemistry)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Group - A

1. Answer **any five** questions : 2×5
- (a) What do the letters CAM stand for? Give one example of a CAM plant.
 - (b) What is the function of light harvesting complex?
 - (c) State the function of bacteriorhodopsin.
 - (d) Why are cyanobacteria oxygenic?
 - (e) What is C₂ cycle?
 - (f) State one application of EMSA.
 - (g) How can the association of LHC II and PS II be regulated?
 - (h) Can scatchard analysis be applied to unpurified proteins?
 - (i) What is surface plasmon resonance?

Group - B

Answer **any two** questions.

2. (a) What are the two processes that photosynthesis in plants encompasses? 2+3
- (b) How does cyanobacteria synthesize ATP?
3. (a) State the factors that prevent the dissipation of energy by internal conversion.
- (b) What is oxygenic photosynthesis? Where does it occur? 2+2+1
4. (a) What are the functional components of ATP synthase?
- (b) What is the function of rubisco?
- (c) Synthesis of each triose phosphate from CO₂ requires how many NADPH and ATP molecule? 2+2+1

Please Turn Over

Group - C

Answer *any three* questions.

5. (a) Explain briefly how plants overcome photorespiration.
(b) Outline the steps involved in synthesis of starch from UDP-glucose.
(c) List the differences between cyclic and non-cyclic photophosphorylation.
(d) Name two light harvesting pigments employed by cyanobacteria. 3+3+3+1
6. (a) Briefly explain the purpose of each of the three stages of the calvin cycle.
(b) Which compartment of mitochondria would be similar to stroma of a chloroplast in terms of function? Give reason.
(c) Briefly explain the structural features of peptidoglycan.
(d) Which is the final electron acceptor of the whole photosynthetic electron transport chain? 3+3+3+1
7. (a) Briefly outline a method used to identify protein-protein interaction.
(b) What methods can be employed to get the thermodynamic profile of a biomolecular interaction?
(c) What forces may be responsible for a strong protein-ligand interaction?
(d) What is CHIP assay? How can it be used to study DNA-protein interaction? Explain. 3+2+2+3
8. (a) What is the relation between K_{ON} , K_{OFF} and K_{eq} ?
(b) Explain any one method that uses fluorescence, which can be employed to study protein-ligand interaction.
(c) What is SPR? What parameters are obtained from SPR for a biomolecular interaction study?
(d) Briefly write about any one application of biomolecular interaction in life science research. 1+3+3+3
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