

Seat No. : _____

NF-125

November-2021

B.Sc., Sem.-V

**305 : Biochemistry
(Techniques in Biotechnology)**

Time : 2 Hours]

[Max. Marks : 50

- Instructions :**
- (1) **All Questions in Section – I** carry equal marks.
 - (2) Attempt any **three** questions in Section – I.
 - (3) Question – **9** in Section – II is **compulsory**.
 - (4) Illustrate your answers with neat diagrams wherever necessary.

Section – I

Attempt any **three** :

1. (a) Explain the isolation and purification of chromosomal DNA. **8**
(b) Explain the steps of gene cloning with a labelled diagram. **6**
2. (a) Explain insertional inactivation to select recombinants with examples. **8**
(b) Write a note on Restriction Endonucleases. **6**
3. (a) Write a note on: Southern Blotting technique. **7**
(b) Give an example to explain restriction mapping. Give its use. **7**
4. (a) Explain in detail with diagram Sanger's method of DNA sequencing. **7**
(b) Explain in detail with diagram Maxam Gilbert's method of DNA sequencing. **7**
5. Explain in detail principle, working and applications of PCR. **14**
6. (a) Write a brief note on any three types or variations of PCR. **8**
(b) What are the differences between PCR and Gene cloning ? **6**

7. (a) Explain the process of Transformation. 7
(b) Discuss conjugation between F⁻ cell and Hfr bacterial cell. 7
8. (a) Explain the process of gene mapping by interrupted conjugation technique. 8
(b) What is generalized transduction ? Explain. 6

Section – II

9. Attempt any 8 : (All questions are of 1 mark each) 8
- (1) What is a vector ?
 - (2) Explain nomenclature of a plasmid with an example.
 - (3) What is the role of CaCl₂ in Transformation ?
 - (4) What is the role of Ethidium bromide ?
 - (5) What is the advantage of agarose gel electrophoresis ?
 - (6) What is nucleic acid hybridization ?
 - (7) What is a northern Blot technique used for ?
 - (8) What is restriction mapping ?
 - (9) What is a dideoxy nucleotide ?
 - (10) Give example of a standard molecular marker used in agarose gel electrophoresis.
 - (11) Write any one application of PCR.
 - (12) Give full form of RT-PCR.
 - (13) Define Transduction.
 - (14) Who discovered the process of bacterial conjugation ?
 - (15) What is interrupted conjugation ?
 - (16) Define Recombination.
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November-2021

B.Sc., Sem.-V

305 : Biochemistry**Elective - (Plant Biochemistry)****Time : 2 Hours]****[Max. Marks : 50**

- Instructions :** (1) All questions in **Section – I** carry equal marks.
 (2) Attempt any **three** questions in Section – I.
 (3) Question – **9** in Section – II is **compulsory**.

Section – I

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|----|--|---|
| 1. | (A) Write a brief note on tissue system (vascular and ground tissue) of plant. | 7 |
| | (B) Describe role of plant organ system. | 7 |
| 2. | (A) Explain structure of chloroplast and its function | 7 |
| | (B) Describe the plant cell wall functions. | 7 |
| 3. | (A) Explain non-cyclic photophosphorylation. | 7 |
| | (B) Describe C ₃ metabolism. | 7 |
| 4. | (A) Explain photorespiration in plant. | 7 |
| | (B) Write a brief note on CAM metabolism. | 7 |
| 5. | (A) Write brief note on nitrogen fixation in plant. | 7 |
| | (B) Explain role of phosphate in plant cells. | 7 |
| 6. | (A) Describe sucrose breakdown in plant system. | 7 |
| | (B) Write a note on Sulphate assimilation | 7 |
| 7. | (A) Explain in points the role of Ethylene or cytokinins. | 7 |
| | (B) Write a short note on Abscissic acid. | 7 |
| 8. | (A) Describe brief note on Salicylic acid. | 7 |
| | (B) Write a brief note on Gibberelins. | 7 |

Section – II**[M.C.Q]**

9. Write answer of any **8** : **8**
- | | | |
|-----|---|------------------|
| (1) | Which is not the cell organelles of plant cell ? | |
| | (a) Chloroplast | (b) cell wall |
| | (c) large vacuole | (d) centriole |
| (2) | Which part of cell help to give shape to the plant cell ? | |
| | (a) Mitochondria | (b) Cell wall |
| | (c) Nucleus | (d) All of above |

- (3) Which process take place during the light reaction, when water is liberation with oxygen ?
 (a) lysis (b) synthesis
 (c) photolysis (d) photosynthesis
- (4) What is present in the tertiary layer of cell wall ?
 (a) Glucuronic acid (b) phloem
 (c) Xylem (d) chitin
- (5) Where is non cyclic photophorylation taking place ?
 (a) Stroma (b) Mitochondria
 (c) thylakoids (d) None of these
- (6) Name the enzyme presence in the process of photorespiration.
 (a) RUBisCO (b) Ribose
 (c) Fructase (d) lecithin
- (7) Which of the following is the correct statement regarding Calvin cycle ?
 (a) It cannot occur during day time (b) It is light independent
 (c) It is light dependent (d) It occurs rapidly at night.
- (8) Name the site of dark reactions takes place ?
 (a) Thylakoid membrane (b) Grana
 (c) Stroma (d) None of these
- (9) Which is a process by which molecular nitrogen in the air is converted into ammonia or related nitrogenous compounds in soil.
 (a) Nitrogen fixation (b) Sucrose synthesis
 (c) Sucrose assimilation (d) Sulphate assimilation
- (10) What is responsible for the inhibition of seed germination ?
 (a) Absciscic acid (b) Auxin
 (c) cytokinin (d) None of these
- (11) _____ is the absorption and digestion of food or nutrients by the plant system.
 (a) Breakdown process (b) Synthesis
 (c) Assimilation (d) None of above
- (12) What is other name of Indole 3 acetic acid is the most known and naturally occurring plant hormone ?
 (a) Auxin (b) Ethylene
 (c) Cytokinin (d) None of these
- (13) Which of the following can prevent the falling of leaves ?
 (a) absciscic acid (b) Cytokinins
 (c) Auxin (d) None of above
- (14) Name the hormone which is capable of delaying yellowing of leaves
 (a) Cytokinins (b) Auxins
 (c) ABA (d) gibberellins
- (15) What is the full form of PQ ?
 (a) Ferredoxin (b) Plastoquinone
 (c) Cytochrome (d) Plastoquinine
- (16) Name the plant hormone that is responsible for the ripening of fruits.
 (a) Cytokinins (b) Auxin
 (c) Ethylene (d) None of the above