

**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<sup>-</sup> 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 CaCl<sub>2</sub> 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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**NF-125**

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**

- |    |  |   |
|----|--|---|
| 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 <sub>3</sub> 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) Fructose (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) Abscisic 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) abscisic 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