

**B.Sc. Sem.-5 Examination****SE-305 (A)****Biochemistry****April-2025****Time : 2-30 Hours]****[Max. Marks : 70**

Instructions: 1. All Questions in Section I and Section II are compulsory and carry equal marks

2. Illustrate your answers with neat diagrams wherever necessary

Q1a) List the important properties of an ideal vector. Give one example. (07)

b) Explain the steps of gene cloning with a labelled diagram (07)

**OR**

Q1 a) Write a note on separation of DNA fragments using agarose gel electrophoresis. (07)

b) Write a note on Restriction enzymes (07)

Q2a) Explain in detail Southern Blotting technique with a diagram. (07)

b) Write a note on Sanger's method of DNA sequencing. (07)

**OR**

Q2 a) Explain in detail Maxam Gilbert's method of DNA sequencing. List the advantages & disadvantages of both the methods of DNA sequencing. (10)

Q2b) List the applications of Southern, Northern and Western Blotting technique (04)

Q3 Explain in detail principle, working and advantages and limitations of PCR (14)

**OR**

Q3 List the differences between gene cloning and PCR. List the applications of PCR (14)

Q4 a) Define Bacterial Recombination. Explain the process of transformation. (06)

Q4b) What is bacterial conjugation. Discuss bacterial conjugation between 1. F<sup>+</sup> & F<sup>-</sup> 2. Hfr & F<sup>+</sup> types. (08)

**OR**

Q4 What is Transduction? Explain in detail specialized and generalized Transduction. (14)

**(P.T.O)**

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**SECTION II : ATTEMPT ANY SEVEN**

**(14)**

- Q.1 Explain the nomenclature of a plasmid using any one example
- 2 What is the role of phenol and chilled ethanol in DNA separation.
- 3 What is the role of cold  $\text{CaCl}_2$  and heat shock in bacterial transformation
- 4 Name the method used to screen the recombinants from transformants using any plasmid vector.
- 5 What is a lambda phage. What is its genome size.
- 6 Who discovered Southern Blotting technique
- 7 What is restriction mapping?
- 8 Name any two variations of PCR. Give the use of any one.
- 9 What is RT- PCR technique.
- 10 Who discovered the PCR. Give the full form of PCR
- 11 What is F plasmid. What is the mechanism of its replication
- 12 Name the scientist who first performed experiments of Transformation

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Candidate's Seat No : \_\_\_\_\_

**B.Sc. Sem.-5 Examination**

**SE-305 (B)**

**Biochemistry**

**April-2025**

**Time : 2-30 Hours]**

**[Max. Marks : 70**

**Q.1** Write a brief note on two main plant organ systems 14

OR

Q.1 Explain in detail on plant cell wall formation 14

Q.2 Describe the steps involved in the light reaction, mentioning the role of photosystems and ATP/NADPH formation. 14

OR

Q.2. Explain photorespiration in plants. Why is it considered a wasteful process? 14

Q.3 a How do plants regulate phosphate uptake and transport? 7

b. Describe pathway of sucrose breakdown in plants and its importance. 7

OR

Q.3 Explain the process of biological nitrogen fixation in plants. 14

Q.4 Write a short note on 14

a. Cytokinins

b. Gibberelin

OR

Q.4. a. Explain 10 important points about Jasmonic acid 7

b. Describe briefly on salicylic acid 7

(P.T.O)

1. What are the functions of the shoot system?
  2. What is the function of the dermal tissue system?
  3. What is photolysis of water?
  4. Name one difference between respiration and photorespiration.
  5. Which cycle is involved in the dark reaction?
  6. What are phosphate transporters and give its function.
  7. Why is sulphate assimilation essential for plant growth.
  8. Write 2 role of xylem in plant
  9. Write 2 difference between C 3 and C4 metabolism
  10. What is effect of Abscissic acid if its reduces in plant
  11. . Write a two role jasmonic acid in plant
  12. Draw the structure of ground tissue of plant
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