Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD (now MoE)
Re-accredited with an 'A++' Grade by NAAC CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – August 2025

Semester - V

Class : III UG
Major: Biochemistry and Biotechnology

Time: 2 hours
Max.marks: 60

23BBTC05 Recombinant DNA Technology and Nanobiotechnology

CO1: Understand the basic steps in a cloning experiment.
CO2: Acquire knowledge about how to isolate a DNA segment, clone it into a suitable vector, introduce into a host and identify the recombinant from non-recombinants. The expression vectors and their importance in Biotechnology will be studied.
CO3: Know the theoretical basis for selection, screening and construction of libraries and expression of genes. Production of insulin using recombinant DNA technology, transgenic crops-merits and demerits will be studied.
CO4: Learn the principles of various genetic engineering techniques as well as their applications.
CO5: Acquire a fundamental understanding of the basic principles of nanotechnology.

Part A- Answer all questions (6X1 = 6)

(Multiple choice questions)

1. Which of the following is an example of a restriction endonuclease? **CO1K2**
   a. EcoR1 b. Ligase
   c. RNA polymerase d. DNA polymerase
2. What is the role of the Ti plasmid in Agrobacterium tumefaciens? **CO1K3**
   a. It causes crown gall disease in plants
   b. It provides antibiotic resistance to bacteria
   c. It replicates bacterial DNA
   d. It synthesize proteins for bacterial growth.
3. Which enzyme is essential for constructing a cDNA library? **CO2K2**
   a. Reverse transcriptase b. RNA polymerase
   c. Ligase d. DNA polymerase
4. Which type of cells are commonly used for microinjection in genetic engineering? **CO2K2**
   a. Plant cells b. Bacterial cells c. Fungal spores d. Animal embryos
5. What is southern blotting primarily used for? **CO3K2**
   a. To detect specific DNA sequences
   b. To detect specific protein sequences
   c. To amplify DNA fragments
   d. To detect specific RNA sequences
6. What is the role of the primary antibody in Western blotting? **CO3K3**
   a. To transfer proteins to the membrane
   b. To bind specifically to the target protein
   c. To separate proteins by size
   d. To amplify the protein signal

Part B

Answer the following **3 x 6 = 18**

Answers should not exceed 200 words or one page

7. (a) Write down the scope of genetic engineering. **CO1K2**

(Or)

7. (b) Explain the important functions of type II restriction endonuclease. **CO1K2**

8. (a) Give a brief description about restriction digestion and mapping **CO1K2**

(Or)

8. (b) Write the basic steps and principle of Microinjection **CO2K3**

9. (a) Write about the difference between genomics and cDNA libraries **CO2K2**

(Or)

9. (b) Write a note on probe preparation **CO3K2**

Part C

3 x 12 = 36

Answer the following not exceeding 700 words or four pages

10. (a) Describe the types of cloning vector and explain the function of vectors. **CO1K2**

(Or)

10. (b) Write a detailed note on Electroporation Technique **CO1K2**

11. (a) What are the methods by which a blunt end DNA can be converted into sticky end? **CO1K3**

(Or)

11. (b) How will you prepare and screen the competent cell? Explain **CO2K2**

12. (a) Explain chromosome Walking and Jumping **CO2K2**

(Or)

12. (b) Give a detailed description of Blotting Technique. **CO3K2**

Staff in-charge : **Dr.S.Gayathri Devi and Dr.A.Gayathri +Dr. K.V.ShaliniSF**

Total Number of copies : **55 + 35**