**Avinashilingam Institute for Home Science and Higher Education for Women**
**Coimbatore – 641 043**

**Continuous Internal Assessment I – April, 2025**

**II Semester**

**Class : I PG** **Max. Marks: 60**
**Major : Biotechnology** **Time: 2 Hours**

**23MBTC10 – Recombinant DNA Technology**

**Course Outcomes**

**CO1**. Students will be able to **demonstrate** the application of various techniques in developing a recombinant molecule
**CO2**. Students will be able to **explain** the process of gene cloning
**CO3**. Students will be able to **relate** the importance of genetically modified organisms for human welfare
**CO4**. Students will be able to **justify** the importance of genome projects and the potential application of recombinant techniques
**CO5**. Students will be able to critically **analyze** the various issue related to gene manipulation

**Part – A** **(6 x 1 =6)**

Choose the correct answer

1. Which among the following best describes the 'safe harbor site' in the genome **(CO3 K1)**
   a. A site where the insert will not be silenced by chromatin modification
   b. A site where the insert will not interfere with the normal functioning of the host cell
   c. A site where integration is easy
   d. A site where recombination is easy

2. Which among the following is not a direct method for gene transfer into plants **(CO3 K1)**
   a. Agrobacterium b. lyophilization c. electroporation d. microinjection

3. What is the primary function of CRISPR/cas system in bacteria **(CO3 K2)**
   a. DNA replication b. hold memory c. protein synthesis d. ATP synthesis

4. Which among the following molecules directs cas9 system to the target site **(CO2 K3)**
   a. DNA b. protein c. RNA d. lipid

5. ELSI stands for **(CO4 K2)**
   a. Engineered Legal Social Issues c. Environmentally Legal Social Initiatives
   b. Ethical Legal and Social Issues d. Ethically Legalized Social Initiatives
6. Regulation of GMOs is governed by the Ministry of _____ in India **(CO5 K3)**
   a. Science and Technology c. Environment, Forest and Climate Change
   b. Commerce d. Department of Biotechnology

**Part – B** **(3 x 6 = 18)**

Answer **ALL** questions.
Each answer should not exceed 400 words or two pages

7 (a) Differentiate top down and hierarchical sequencing approaches **(CO3 K1)**

(Or)

7.(b) When was rice genome project started and when was the draft sequence released? How many countries were involved? What is the contribution of India to rice genome sequencing? What are the applications of rice genome project **(CO3 K2)**

8 (a) What is the classical method to treat diabetes. How is recombinant insulin produced? Write a note on the advantages of the technology **(CO4 K2)**

(Or)

8. (b) What is biofortification? How is golden rice produced? What are the genes that were modified to produce vit A enhanced rice **(CO4 K3)**

9 (a) How do you maintain the shelf life of tomato? Explain the application of anti-sense technology **(CO4 K3)**

**(Or)**

9.(b) Discuss the case of Basmathi rice and its IPR process **(CO5 K4)**

**Part – C** **(3 x 12 = 36)**

**Answers should not exceed 800 words or four pages**

10 (a) What are the advantages of NGS over sanger sequencing? Explain in detail any two NGS platforms **(CO3 K2)**

(Or)

10. (b) What do you mean by genome projects? Describe how human genome was sequenced and the applications of the outcome of HGP **(CO3 K2)**

11 (a) What are genetically modified plants? With the example of Bt cotton, explain the process of development of genetically modified plants **(CO4 K3)**

(Or)

11.(b) How does genome editing work? What is the current progress of genome editing. What are the promising applications of genome editing. **(CO3 K3)**

12 (a) What are the safety norms one has to follow while working with genetically modified organisms? What the regulatory authorities functioning in India for the release of GMOs **(CO5 K2)**

(Or)

12.(b) What do you mean by a patent? What are the different kinds of patents? What is the difference between IPR and patent **(CO5 K3)**

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**Staff in-charge: Dr.Kalaiselvi Senthil** **10 copies**