Reg.No.									

INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

IV SEMESTER B.S. DEGREE EXAMINATION – APRIL/ MAY 2017

SUBJECT: GENETIC ENGINEERING (BT 243)

(BRANCH: BIOTECHNOLOGY)

Friday 21 April 2017

Time: 3 Hours **Max. Marks: 100**

- ✓ **Answer ANY FIVE full Questions.**
- ✓ **Missing data, if any, may be suitably assumed**

1A. What is the main purpose of cloning and expression vectors? Present a simple labelled schematic for each of them. What is a promoter and state its desirable feature

1B. Discuss about the restriction modification systems, II and III. Which system is useful for genetic engineering applications? Justify. **[10+10]**

2A. How are the following probes synthesized? (i) Oligonucleotide probes (ii) Single stranded DNA probes (iii) Double stranded DNA probes. Also, add a brief note about their application.

2B. Define an SNP. Where can they occur? Discuss any four application of SNPs. **[10+10]**

3A. What is the function of the enzyme DNA Ligase? Describe its mechanism of action, in detail. What are the different types of DNA ligases? State examples.

3B. With an example, explain the major steps in restriction mapping. **[10+10]**

4A. What is a RFLP? How is it carried out? How does RFLP occur, owing to VNTR length variation?

4B. Explain, in detail, the Maxam-Gilbert Sequencing method for DNA sequencing. **[10+10]**

5A. What is a genomic DNA library? Discuss how it is constructed. After library construction, how is it probed?

5B. Give an account of primers used in polymerase chain reaction. What are the considerations to be taken care, when designing a primer? **[10+10]**

6A. Explain, in detail, the Chain Terminator Method for DNA sequencing.

6B. What is the mode of action of glyphosate resistance in plants? Give the reaction pathway. How is homopolymer tailing done with terminal transferase enzyme? Give a simple schematic. **[10+10]**

7A. Write a short note on linkers. Explain how it is used in recombinant DNA technology. Present a labelled schematic diagram.

7B. Describe, in detail, the steps involved in the construction of cDNA library. **[10+10]**

8A. What is Southern Blotting technique used for? Describe the protocol with a labelled schematic?

8B. What do you understand by tags or fusion proteins? What is the purpose of a protease cleavage site? What are the potential advantages of fusion proteins? **[10+10]**