Seat No. : _____

NG-109

November-2025

B.Sc., Sem.-V

DSC-C-BT-352 T : Biotechnology
(Molecular Biology and rDNA Technology)

Time : 2:00 Hours] **[Max. Marks : 50**

1. What is PCR ? Explain its principle, steps and types of PCR with a diagram. **10**

OR

1. (A) What are molecular markers ? Explain the mechanism of RFLP with a diagram. **5**

1. (B) What is blotting ? Write its importance and explain Southern blotting with a diagram. **5**

2. Write the procedure of 'Isolation of genomic DNA from prokaryotic cells', explain the principles involved behind each step with proper illustrations. **10**

OR

2. (A) Write the difference between Maxam-Gilbert and Sanger dideoxy sequencing method. **5**

2. (B) Write a short note on DNA fingerprinting. **5**

3. Explain in detail with proper illustrations the various enzymes used in rDNA Technology. **10**

OR

3. (A) Write the differences between a genomic library and a cDNA library. **5**

3. (B) Describe the criteria for the selection of a good vector and explain the plasmid vector with a diagram. **5**

4. Explain in details *Trp* operon with labelled diagram, focusing on negative and attenuation contro1. **10**

OR

4. (A) Write the difference between lytic and lysogenic cycle in bacteriophage. **5**

4. (B) Discuss DNA methylation and acetylation with diagram in prospect of Eukaryotic gene regulation. **5**

5. Answer the following : (any **ten** out of **twelve**) **10**

(1) What are shuttle vectors ?

(2) Give an application of gene cloning.

(3) Give full form of BAG and YAC.

(4) What is the advantage of Gene isolation by DNA shotgun method ?

(5) Draw the diagram of pBR322.

(6) What is the principle of restriction mapping ?

(7) What is SNP ?

(8) What is pyrosequencing ?

(9) Name the genes present in a Lac Operon.

(10) What is the importance of intron in a eukaryotic genome ?

(11) What is the splicing ?

(12) What is the basic difference between a genomic DNA and a Plasmid DNA ?
