Time: 3 Hours Total Marks: 80

1) Question 1 is **compulsory**.
2) Attempt **any three** questions from the rest.
3) Draw diagrams wherever applicable.

1. (a) Describe the following: 10
   i) Blue white selection
   ii) Sanger's sequencing method
   (b) Write a note on Watson and Crick model of DNA double helix 10

2. (a) *Agarobacterium tumefaciens* is a natural genetic engineer. Justify. 10
   (b) What are different ways of plasmid purification? Explain rationale behind each. 10

3. (a) Give an account of different promoters used in expression vectors. How does choice of promoters affect the efficiency of these vectors? 10
   (b) Discuss the general problems associated with the production of recombinant protein in *E. coli*. 10

4. (a) Describe with diagrams making of phagemids and its use in cloning to achieve single stranded DNA. 10
   (b) Write features and classification of restriction endonucleases. 10

5. (a) How does PCR result in exponential amplification of DNA ? Explain. 10
   (b) What is antisense technology? Explain with an example its usefulness in plant genetic engineering. 10

6. Write short note on following: 20
   (a) c-DNA library
   (b) Fusion proteins
   (c) Recombinant insulin
   (d) Gene gun