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- Notes : 1. All questions are compulsory and carry marks as indicated.
2. Draw diagram wherever necessary.

1. Describe different methods for isolation and purification of gene. **16**

OR

- a) Write a note on DNA topoisomerase and ligases. **8**
b) Write a note on nucleases (exonucleases and endonucleases) **8**

2. Describe the methods for insertion of foreign DNA in vector and host cell. **16**

OR

- a) Discuss Linkers and Adapters. **8**
b) Write a note on cosmid vectors and phagemid vectors **8**

3. Describe in detail blotting techniques. **16**

OR

Write note on followings-

- a) cDNA library **8**
b) Automated DNA sequencing **8**

4. Describe in detail various chemical methods used for transfection. **16**

OR

- a) Discuss calcium phosphate co-precipitation. **8**
b) Give note on DNA uptake by bacterial cells. **8**

5. Write notes on:

- a) Restriction modification system. **4**
b) Write note on Biolistics. **4**
c) Write on Sanger-Coulson dideoxynucleotide method. **4**
d) Write on M₁₃ Vector. **4**
