

M.Sc. - II (Biotechnology) (NEP Pattern) Semester-III  
**STPG03BTH003 - Paper-III : Genetics Engineering**

P. Pages : 1

Time : Three Hours



**GUG/S/25/15948**

Max. Marks : 80

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

1. Describe in detail methods for isolation of DNA from microbes. Give significance. **16**

**OR**

Add notes on:

- a) Alkaline transferase and mechanism of action. **8**  
b) Gene isolation and purification. **8**

2. What are Cloning vectors? Describe various types of Vectors and characteristics. **16**

**OR**

- a) Describe various methods of Insertion of DNA. **8**  
b) Explain various Ligation methods of DNA. **8**

3. Describe various methods of Nucleic acid hybridization with suitable examples. **16**

**OR**

- a) Add note on – Gene libraries and molecular probes. **8**  
b) Explain various methods of DNA sequencing. **8**

4. What is transfection? Describe various methods of transfection and give applications. **16**

**OR**

Add notes on:

- a) Gene transfer by pronuclear microinjection. **8**  
b) Transformation: DNA uptake by bacterial cells. **8**

5. Write short notes on: **4x4**

- i) DNA modification enzymes.  
ii) Homopolymer Tailing.  
iii) cDNA library.  
iv) Viral vectors.

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