

**MAJOR BASED ELECTIVE III - BIOTECHNOLOGY**

**Theory:-**

**Unit I**

Biotechnology-Definition, importance, Application areas in biotechnology.  
Gene Transfer mechanisms in Bacteria: Transformation, transduction and Conjugation.

**Unit II**

Plasmids - General account; Plasmids as vectors Eg. pBR 322, Ti-plasmid;

Cosmids, phagemids, Lambda-phage; transposons; site directed mutation (mutagenesis)

**Unit III**

Genetic Engineering : Steps involved in gene cloning and Southern, Western blotting and PCR technique. Role of Agrobacterium in genetic engineering.

**Unit IV**

Agricultural biotechnology:

Biomass production – Food (single cell proteins) Bio-fertilizers-Biological Nitrogen fixation.

Tissue culture- sterilization methods, media preparation (MS medium)use different Parts as explant materials and callus growth.

**Unit V**

Environmental Biotechnology:- Waste treatment –solid (compost), Liquid (Industrial effluents), sewage treatment(domestic sewage)

No Practical for this paper.

**Text Book:**

1. R.C. Dubey: A text book of Biotechnology, S.Chand & Co., New Delhi
2. P. Parihar : A text book of Biotechnology, Argobios Publications, Jodhpur

**Reference Book:**

1. P.K. Gupta: Elements of Biotechnology, Restogi Publications, Meerut
2. Kalyan Kumar De: Plant Tissue culture, New central Book Agency, Calcutta
3. M.D. Kumar: A text book on Biotechnology, East west press, New Delhi
4. S.S. Purohit: Agricultural Biotechnology, Agrobios Publications, Joshpur
5. S. Ignacimuthu: Plant Biotechnology, Oxford & IBM Publishing Co., New Delhi
6. Trevan, Boffey, Goulding & Stanbury: Biotechnology – The Biological Principles, Tata Mc Graw Hill Publishing Co., New Delhi
7. A.K Chatterji: Introduction to Environmental Biotechnology, Prentice Hall India Pvt., Ltd., New Delhi