

M.Sc. Examination, 2016
Semester-III
Biotechnology
Course – XI
(Genetic Engineering)

Time: 3 Hours

Full Marks: 40

Questions are of value as indicated in the margin.

Answer *any four* questions.

1. What vector is used in recombinant DNA techniques? Briefly enumerate four salient features of an ideal plasmid vector. Describe schematically, a general method for the purification of plasmid DNA from bacteria. What is the ideal reason for using a cosmid vector instead of a plasmid vector? Briefly state, with proper reason, the use of a shuttle vector. 2+2+2+2+2=10
 2. Discuss the mechanism of DNA methylation with suitable figures. Draw a properly labelled diagram showing a generalized scheme of cloning a foreign gene in a plasmid vector. Enumerate four major precautions to be observed during mRNA isolation. 3+3+4=10
 3. Draw a flowchart showing the steps involved in the preparation of total cDNA from eukaryotic cells. Briefly discuss how will you proceed if you have to make a cDNA library of the product you made in plasmid vector. Draw a schematic diagram to show the method using which you can identify and pick up a specific gene from this cDNA library. 3+4+3=10
 4. Describe with the help of suitable figures the method of Northern transfer. Give an example of the expression related information of a gene that you can get out of a Northern transfer experiment. Enumerate two technical differences between Northern and Southern hybridization techniques. 5+3+2=10
 5. Explain with suitable figures how antisense RNA can be used in fighting disease. Give two important application of PCR in forensics and the detection of diseases. 5+5=10
 6. Write short notes on (*any four*): 2.5×4=10
 - (a) Genomic library
 - (b) Maxam-Gilbert sequencing method
 - (c) Terminal transferase
 - (d) Cosmid vector
 - (e) Isoschizomers
 - (f) Real time PCR
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