

Seat No. : _____

AB-115

April-2016

B.Sc., Sem.-VI

307 : Microbiology

(Genetic Engineering & Biotechnology)

Time : 3 Hours]

[Max. Marks : 70

- Instructions :** (1) Draw figures wherever necessary.
(2) Mention correct question number against each answer.
(3) Figures to the right indicate marks.

1. Describe the following : (any **two**). **14**
- (a) Outline of gene cloning procedure along with diagram.
 - (b) Role of restriction endonuclease, reverse transcriptase and the vector cosmid in rDNA technology.
 - (c) Site directed mutagenesis and its relevance in molecular biology.
 - (d) Principle of PCR and its significance.
2. Answer the following : (any **two**) **14**
- (a) Differentiate between genomic library and cDNA library. How are they constructed ?
 - (b) Explain, how the complementary 'sticky ends' and 'polylinkers' do help in joining the DNA of interest and the vector DNA ?
 - (c) Describe various physical and chemical methods for transferring rDNA into suitable host cells.
 - (d) Explain the use of marker genes and X-gal dye for identification and selection of recombinant population.
3. Explain the following : (any **two**) **14**
- (a) Biotechnology and its benefits to human welfare in different areas.
 - (b) Methods of plant tissue culture.
 - (c) Principle and application of electrophoresis.
 - (d) Principle and role of ELISA in clinical diagnosis.

4. Answer the following : (any **two**) **14**
- (a) What are transgenic plants ? Explain their benefits and debate regarding the health hazards.
 - (b) Explain giving examples the role of enzymes in everyday products like paper, detergents, textiles, foods, beverages, and leather.
 - (c) Describe various methods of *in situ* bioremediation.
 - (d) What are the important ethical problems associated with the rDNA techniques ?
5. Give short and specific answers in **1-2** lines only. **14**
- (1) Name the bacterium which is often credited as ‘natural genetic engineer’ ?
 - (2) What is the name of the restriction endonuclease obtained from *Haemophilus influenzae* serotype ?
 - (3) What is the purpose of heating the DNA sample to 94-96 °C in PCR ?
 - (4) Name law which states that ‘there is a logarithmic dependence between the transmission of light through a substance and the distance the light travels through the material’.
 - (5) Name two factors which determine the rate of migration of biological macromolecules in chromatography.
 - (6) Which plant hormone is responsible for proliferation roots in plant culture medium ?
 - (7) Which microbial products help in MEOR ?
 - (8) What are recalcitrant compounds ?
 - (9) Name the technique used for separation of mixture proteins on polyacrylamide gel in Western blotting.
 - (10) Which was the first genetically modified crop introduced in India and whose genes are transferred (introduced) to this plant ?
 - (11) What is the purpose of using pectinase in fruit juice ?
 - (12) Write the full form of TRIPS Agreements
 - (13) What is an explant ?
 - (14) What are the main components of biogas ?
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