AR – 550

Third Semester B. Sc. (Part – II) Examination

3S : MICROBIOLOGY

(Molecular Biology and Genetic Engineering)

P. Pages : 7

Time : Three Hours] [Max. Marks : 80

Note : (1) All questions are compulsory.
(2) Draw neat and well labelled diagram wherever necessary.

1. (A) Fill in the blanks :—

   (i) Transfer of DNA from one bacterial cell to other by bacteriophage is called as ————.

   (ii) The source of ECORI restriction enzyme is ———.

   (iii) Thymine diamers are induced by ——— rays.

(iv) Cos site of λ are present in ——— vector tha has other properties of plasmid. 2

(B) Choose the correct alternative :—

(i) The source of Taq DNA polymerase is ———.

(a) Treponema pallidum

(b) Treponosoma species

(c) Thermus aquaticus

(d) Salmonella typhi.

(ii) The initiation codon for protein synthesis is ———.

(a) UAA

(b) UAG

(c) GUA

(d) AUG

(ii) PBR 322 plasmid contains ——— genes.

(a) Ampicillin resistant gene

(b) Origin of Replication

(c) Tetracycline Resistant gene

(d) All of the above three.

(iv) Agrobacterium tumifacians is used to transfer transgene in ————.

(a) Bacteria

(b) Plants

(c) Animals

(d) Viruses. 2

(C) Answer in **one** sentence :

(i) What is the role of promoter in an operon ?

(ii) What are induced mutations ?

(iii) Define 'primer' in replication.

(iv) What are GMO's ? 4

2. Describe the mechanism of DNA replication with enzymes involved in it.

OR

Describe in detail the process of translation. 12

3. (a) Describe in brief nonsense and Missensene mutations. 4

(b) Give schematic diagram of Lac operon. 4

(c) Describe in brief Intragenic suppressions. 4

OR

(d) Describe in brief induced mutation by Nitrous oxide. 4

(e) Give schematic diagram of lac operon. 4

(f) Describe in brief physical mutagens. 4

4. Explain Lederberg - Tatum experiment and Davis U Tube experiment for conjugation.

OR

What is Transduction ? Describe in detail mechanism of generalized transduction. 12

5. (a) What is Genetic Engineering ? Give the outline of different steps involved in Genetic Engineering. 4

(b) Describe in brief plasmid vector with any one example. 4

(c) Describe in brief the use of polynucleotide kinase enzyme in recombinant DNA technology. 4

OR

(d) What are Restriction endonucleases ? Explain its nomenclature with examples. 4

(e) What are vectors ? Discuss their ideal characters. 4

(f) Explain the action of any two DNA modifying enzymes. 4

6. (a) Describe the technique of southern blotting. 4

(b) Describe in brief microarray technique for DNA sequencing. 4

(c) What is cDNA Library ? How is it constructed ? 4

OR

(d) Describe in brief Colony Hybridization. 4

(e) Describe the procedure of Agarose Gel Electrophoresis. 4

(f) Describe in brief PCR. 4

7. (a) Discuss in brief biotechnological aspects of Insulin production. 4

(b) What is Gene therapy ? Explain with suitable example. 4

(c) Explain in brief Transgenic plants. 4

OR

(d) Briefly describe use of DNA probes in disease diagnosis. 4

(e) Explain in brief role of Genetically Engineered microbes in pollution control. 4

(f) Describe in brief Recombinant Hepatitis Vaccine. 4