

## B.Sc. (Part—II) Semester—III Examination

## 3S : MICROBIOLOGY

## (Molecular Biology and Genetic Engineering)

Time : Three Hours]

[Maximum Marks : 80

**Note :—**(1) ALL questions are compulsory.

(2) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

- (i) Synthesis of RNA using DNA template is called as \_\_\_\_\_.
- (ii) Lac Z gene of Lac operon codes for \_\_\_\_\_.
- (iii) Eco RI is isolated from the bacteria \_\_\_\_\_.
- (iv) Cos site of  $\lambda$  is present in \_\_\_\_\_ vector that has other properties of plasmid.

(B) Choose the correct alternative :

- (i) \_\_\_\_\_ is a termination codon.
  - (a) UAG
  - (b) AUG
  - (c) AGU
  - (d) GUA
- (ii) Agrobacterium Tumifaciens used for transfer of gene in \_\_\_\_\_.
  - (a) Bacteria
  - (b) Plants
  - (c) Animals
  - (d) Yeast
- (iii) Ampicillin and \_\_\_\_\_ resistance genes are present in pBR322.
  - (a) Penicillin
  - (b) Gentamicin
  - (c) Tetracycline
  - (d) Streptomycin
- (iv) Conjugation in bacteria was discovered by the scientist \_\_\_\_\_.
  - (a) Griffith
  - (b) Lederberg and Tatum
  - (c) Zinder and Lederberg
  - (d) None of the above

(C) Answer in one sentence :

- (i) What is DNA polymerase ?
- (ii) What are GMO's ?
- (iii) What are induced mutations ?
- (iv) Where anticodons are present ?

2. (A) Describe in detail DNA replications with enzymes involved in DNA replication. 12
- OR**
- (B) Describe in detail light and dark repair of DNA with diagrams. 12
3. Describe in brief :
- (A) Structural genes of Lac operon. 4
- (B) U.V. rays as mutagens. 4
- (C) Frame shift mutations. 4
- OR**
- (D) Regulatory genes of Lac operon. 4
- (E) 5-BU as mutagen. 4
- (F) Nonsense mutations. 4
4. Explain the following in brief :
- (A) Hfr × F<sup>-</sup> conjugation. 4
- (B) Transduction. 4
- (C) Griffith experiment. 4
- OR**
- (D) F<sup>+</sup> × F<sup>-</sup>. 4
- (E) U tube experiment for conjugation. 4
- (F) Experiment of Lederberg and Tatum. 4
5. Describe in short :
- (A) Ideal characters of plasmid vectors. 4
- (B) Features of pBR322. 4
- (C) Nomenclature of restriction endonuclease. 4
- OR**
- (D) Action of restriction endonucleases. 4
- (E) Cosmid vectors. 4
- (F) Exonuclease and endonuclease. 4
6. Write in brief about the following :
- (A) Colony hybridization. 4
- (B) Isolation of plasmid DNA from bacteria. 4
- (C) Construction of gene library. 4
- OR**
- (D) Agarose gel electrophoresis. 4
- (E) Southern blotting. 4
- (F) Identification of transformed cells. 4
7. Describe in detail the biotechnological concept of production of recombinant Hepatitis B vaccine. 12
- OR**
- Describe the development and applications of transgenic plants. 12