

## BTI- 301 Molecular Biology

## Instructions:

- (1) All questions in **section I** carry equal marks.
- (2) Attempt any **THREE** questions in **section I**.
- (3) Question IX in **Section II** is **COMPULSORY**.
- (4) Draw figures where necessary. Show question number against each answer.
- (5) Figures in right are marks.

## Section I

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|-----|--|---|
| Q.1 | (A) What is the significance of genetic map? Illustrate genetic map of <i>E. coli</i> .  | 7 |
|     | (B) Discuss different types of mapping techniques.                                       | 7 |
| Q.2 | (A) Illustrate physical map of Lambda phage  | 7 |
|     | (B) Discuss human Genome project and its outcome.  | 7 |
| Q.3 | (A) Explain DNA sequencing by Sanger's dideoxy method.                                   | 7 |
|     | (B) Write a note on shot gun sequencing method.  | 7 |
| Q.4 | (A) Write a detail note on Mass spectroscopy using MALDI-TOF.                            | 7 |
|     | (B) Discuss DNA fingerprinting and its applications                                      | 7 |
| Q.5 | (A) Illustrate rDNA technology with suitable diagrams.                                   | 7 |
|     | (B) What are DNA modifying enzymes? Discuss their role in rDNA technology.               | 7 |
| Q.6 | (A) Write a note on cDNA libraries.  | 7 |
|     | (B) Discuss types of vectors used in recombinant DNA technology.                         | 7 |
| Q.7 | (A) What is Operon? Explain positive control in lac operon with suitable diagrams.       | 7 |
|     | (B) Explain attenuation regulation in operons stating suitable example.                  | 7 |
| Q.8 | (A) write a note on Cis and Trans regulatory elements in eukaryotes.                     | 7 |
|     | (B) Explain regulatory mechanism involved in lytic-lysogenic decision in bacteriophages? | 7 |

## Section II

Q.9 Answer in short (any eight) -

8

- (1) Define linkage?
  - (2) Give biotechnological importance of *Saccharomyces cerevisiae*.
  - (3) What is model organism?
  - (4) Give full forms of STMS and SSCP.
  - (5) what is FISH?
  - (6) What is DNA foot printing?
  - (7) Differentiate between genomic and cDNA library.
  - (8) Give full form of BAC and YAC.
  - (9) Which type of restriction enzymes are used in genetic engineering?
  - (10) What is role of Terminal transferase in rDNA technology?
  - (11) What is the role of Phosphatase enzyme in rDNA technology?
  - (12) What is catabolite repression?
  - (13) What is the genome size of *Arabidopsis thaliana*?
  - (14) State full form of RFLP.
  - (15) What is NCBI and PDB?
  - (16) Define molecular marker
  - (17) Name one virus based vector used in genetic engineering.
  - (18) What is Dorsal protein?
  - (19) Give two example of quorum sensing.
  - (20) Where does ribozyme switches located on RNA?
  - (21) What is genomic imprinting?
  - (22) Define post transcriptional modification.
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