

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

1	3	8	0	3
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Exam. Code :

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B.Sc. (Hons.) (Bio-Technology) FYUP 1st Semester
(2125)

INTRODUCTION TO BIOTECHNOLOGY

Paper : BIOT-101 DSC-(MAJ/MIN)-I

Time Allowed : Three Hours]

[Maximum Marks : 68

Note :— Attempt **five** questions in total. Question No. 1 is compulsory. Attempt **one** question from each unit. Compulsory Question will be of **12** marks. Rest all questions will be of **14** marks each.

(Compulsory)

1. (a) Define biotechnology and mention its two broad application areas.
- (b) Why is *E. coli* considered the workhorse of molecular biology?
- (c) Distinguish between genomics and transcriptomics.
- (d) Why is agarose gel used in electrophoresis for DNA?
- (e) Give environmental benefit of green biotechnology.
- (f) What is the basic principle of gene therapy?
- (g) What is bioterrorism? Give one example.
- (h) Why are ethical considerations important in biotechnology?

1.5×8

UNIT—I

2. (a) What makes *Arabidopsis thaliana* a suitable model for plant genetics?
- (b) Why is *Mus musculus* considered a preferred mammalian model for studying complex human diseases? 7,7
3. (a) Compare *Drosophila melanogaster* and *Caenorhabditis elegans* as multicellular model organisms in biotechnology research.
- (b) State advantages of using *Saccharomyces cerevisiae* as a model organism. 8,6

UNIT—II

4. (a) Describe the molecular organization of the prokaryotic genome with an example.
- (b) Explain proteomics and metabolomics and their significance. 7,7
5. (a) Explain the principle and working of a centrifuge.
- (b) What are the differences between dry heat and moist heat sterilization methods? 7,7

UNIT—III

6. (a) Explain the role of green biotechnology in mitigating industrial pollution.
- (b) Discuss the use of biotechnology in developing disease diagnostics. 7,7
7. (a) Explain applications of gene therapy.
- (b) How does biotechnology contribute to agricultural productivity improvement? 7,7

UNIT—IV

8. (a) Discuss the process and applications of developing transgenic plants.
- (b) Give various applications of genetically modified animals. 8,6
9. (a) Define biowarfare. What are the potential threats it poses to society?
- (b) Discuss the ethical, legal, and social issues associated with GMOs. 6,8