

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

1	3	8	0	4
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Exam. Code :

5	0	5	1
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B.Sc. (Hons.) (Bio-Technology) (FYUP) 1st Semester
(2124)

INTRODUCTION TO BIOTECHNOLOGY

Paper : BIOT-102-T

Time Allowed : Three Hours] [Maximum Marks : 68

Note :— Attempt *five* questions in total. Question No. 1 is compulsory and of 12 marks. Attempt *two* questions from each Unit. Each question in both Units is of 14 marks.

1. Explain the following :—

- (a) How do bacteria act as workhorses in biotechnology ?
- (b) Explain the role of *Danio rerio* in understanding human diseases.
- (c) What makes *E. coli* a model organism in research ?
- (d) What distinguishes genomics from proteomics ?
- (e) How does sterilization ensure accuracy in experiments ?
- (f) What are plasmids ?
- (g) Give two applications of biotechnology in medicine.
- (h) What are social implications of biotechnological innovations ?

8×1.5=12

UNIT—I

2. (a) What is the importance of model organisms in biotechnology research ?
(b) Describe the role of *Saccharomyces cerevisiae* in biotechnology. 7,7
3. (a) Why is *Arabidopsis thaliana* significant for plant genetics ?
(b) Compare *Drosophila melanogaster* and *Caenorhabditis elegans* as research models. 6,8

UNIT—II

4. (a) How do transcriptomics and metabolomics have applications in biotechnology ?
(b) Explain the principle of agarose gel electrophoresis and its applications. 6,8
5. (a) Write a short note on pBR322 and pUC8 and its properties.
(b) Discuss the importance of centrifugation in isolating cellular components. 8,6

UNIT—III

6. (a) Describe the application of green technology to control pollution.
(b) How has biotechnology revolutionized medical diagnostics ? 7,7

7. (a) Explain with examples why is biotechnology useful for sustainable agriculture.
- (b) Discuss the principles and challenges of gene therapy.

7,7

UNIT—IV

8. (a) Describe the applications of transgenic plants in biotechnology.
- (b) Discuss the concept of Bioterrorism and Biowarfare. 6,8
9. (a) Write a short note on the ethical implications of biotechnology.
- (b) Explain the significance of transgenic animals in research.

6,8