

Biotechnology and Bioinformatics

Time: Three Hours Maximum Marks: 70

Note: Attempt any five questions. All questions carry equal marks.

1. a) Describe replication of DNA in brief giving emphasis on enzymes involved in it 7
b) Comment on translation and post translational modification. 7

2. a) Define innate immunity and acquired immunity. Discuss the factors affecting immunity. 5
b) Differentiate active and passive immunization. Discuss any one genetically improved vaccine. 5
c) Explain the utility of multiple booster dose and why some vaccines are given in the period of 12-15 months, not before.

3. a) Enlist the methods of analysis of cloned sequences of DNA. Explain restriction mapping and southern blotting in detail.
b) Add a note on restriction enzymes, their nomenclature & classes.

4. a) Discuss the factors affecting the diffusion of drugs across the plasma membrane. How ions can be transported through plasma membrane.
b) A committee of 5 people is to be appointed from 4 officers of the medical department. 5 of engineering department. 4 of chemistry and 3 of the maths department. Find the probability of forming the committee in the following manner. '
 - i) There must be one from each category
 - ii) There must be at least one from engineering and one from medical department.
 - iii) No one from maths department.
5. a) What is Gene Therapy? Give its advantages over conventional therapy. Discuss its application in treating five diseases.
b) Discuss various approaches for gene transfer & therapy. 4

6. a) Discuss the genes giving examples involved in initiation & inhibition of cancer. 8
b) Explain the role of p53 and bcr gene in cancer. 6

7. Short notes on - (any two):
 - i) Sampling plans.
 - ii) Biological databases
 - iii) Mitosis.