

## MSc Sem.-2 Examination

407

## Bioinformatics

May-2025

[Max. Marks : 70]

Time : 2-30 Hours]

Q1: I. Discuss the various types of chromosomal aberrations and ploidy. How do these variations affect organisms. (7)

II. Discuss the concept of extra-chromosomal inheritance. Include the structure and function of chloroplast and mitochondrial genomes. (7)

OR

I. Explain Mendel's laws of inheritance with examples from pea plant experiments. (7)

II. Give a note on the mechanism of linkage and crossing over. (7)

Q 2: I. Write a note on plant improvement techniques & explain Gene editing technology. (7)

II. Explain Gene expression using lac operon as example. (7)

OR

I. Compare and contrast the different forms of DNA (A-DNA, B-DNA, Z-DNA) in terms of structure and biological significance. (7)

II. Write a note on protein translation mechanism in prokaryotes. (7)

Q 3: I. Explain the process of DNA barcoding & its significance in species identification. (7)

II. Write a note on microarray and its types. (7)

OR

I. Write a note on PCR technique and give its applications. (7)

II. Write a detailed note on restriction enzymes and their functions. (7)

Q4: I. Write a brief note on Bioethics. (7)

II. Give brief account on Intellectual Property Rights and its applications. (7)

OR

I. What are the key features of Biosafety level labs? (7)

II. Write a note on various committees and protocols for approval of transgenics in India. (7)

Q5 Answer the following. (Any Seven) (14)

Q1. Define mutagens and its types?

Q2. What are FTO genes and their role in obesity?

Q3. Write a note on type I transposons?

Q4. What does CRISPR stand for?

Q5. Define Marker assisted plant breeding.

Q6. Define genetic codons and their role.

Q7. What are the primary genetic markers used in DNA barcoding?

Q8. What is the role of Taq polymerase in PCR?

Q9. Name all enzymes used in the construction of genomic libraries.

Q10. Define Southern blotting and northern blotting.

Q11. Define rDNA Technique with one example.

Q12. Which of the following is the Symbol of Maharaja of Air India is

A. Copyright

B. Patent

C. Trademark

D. All of the above