M.Sc. Examination 2022
Semester III
Biotechnology
Core Course - XII
(Animal & Plant Biotechnology)

Time: 3 hours   **Full Marks: 40**

Questions are of values as indicated in the margin

Group A - Animal Biotechnology

Answer any two questions   **10 x 2 = 20**

1. a) Describe the typical set up of an animal cell culture laboratory. What are the protection measures necessary for animal cell culture?
b) What is meant by subculture or passage? Draw and explain a typical growth cycle. What are the general characters of a cell line?

$$(3+2)+(1+2+2)=10$$

2. a) What is the difference between totipotent and pluripotent stem cells? What are the potential therapeutic applications of iPSCs?

b) What is Fate map – explain with example. Mention the distinctive features of the ova of sea-urchin and mammals.

$$(1+4)+(2+3)=10$$

3. a) Schematically explain the gradual development of Lentiviral vectors.

b) Write short notes on (any two)
     i) Adenovirus vectors
     ii) MTT assay
     iii) Class III Biosafety cabinet

$$5+(2.5x2)=10$$

Group B - Plant Biotechnology

Answer any two questions   **10 x 2 = 20**

4. What is somaclonal variation? How these variations develop in plant tissue culture derived plants? Give a brief description on genetic engineering of crop plants for abiotic stress tolerance. What are the advantages of "Calgen's Flavr Savr" tomato over normal tomato? How this tomato was developed?

$$1+1+4+1+3=10$$

5. What is co-integrated vector? How it differs from binary vector? What are the advantages of binary vector over co-integrated vector? Diagrammatically describe the different constructs employed for development of golden rice I and II with proper line diagram?

$$2+2+2+4=10$$

6. What do you mean by disease triangle in plant pathology? How humans influence this triangle? Discuss the R-avr interactions in plant pathology along with the "guard hypothesis". Describe the different types of plant R proteins with structural features.

$$2+1+3+4=10$$