**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

Register Number:

Date:

**B.Sc. BIOTECHNOLOGY - VI SEMESTER**

**SEMESTER EXAMINATION: APRIL 2022**

**(Examination conducted in July 2022)**

**BT 6218: Plant, Environmental and Animal Biotechnology**

**Time- 2 ½ hrs Max Marks-70**

**This question paper contains *ONE* printed page and *THREE* parts**

**Part A (Answer *ANY TEN* questions) 2mx10=20marks**

1. What are reporter genes? Give two examples.
2. Describe the main strategy employed to engineer phosphinothricin tolerance in crop plants.
3. How are silicon carbide fibers used in plant transformation?
4. What is RAPD?
5. Describe any two factors that impact the rate bioremediation process.
6. Draw and label the flowchart of the composting process.
7. What are the four objectives of the wastewater treatment process?
8. Name any two physical properties of air and write a sentence about each.
9. Briefly state the principle behind the development of Dolly.
10. Is dialysis a downstream purification process? Justify.
11. State two animal models used in cancer research.
12. Briefly differentiate between enzymatic and mechanical disaggregation of cell lines.

**Part B (Answer *ANY FIVE* questions) 6mx5=30marks**

1. With examples, describe the various approaches to engineer herbicide tolerance in crop plants.
2. Briefly describe Molecular Pharming of Hirudin and Phytase.
3. Answer the following.
   1. State one difference between Metagenomics and Metabarcoding. (1marks)
   2. What is species biodiversity? Explain its types. (5marks)
4. Explain the functioning of *Bacillus sphaericus* as a bioinsecticide.
5. Explain the 5R policy and its importance.
6. Detail the steps used in designing an expression vector with a suitable example.
7. Describe the process of passaging a suspension cell line.

**Part C (Answer *ANY TWO* questions) 10mx2=20marks**

1. Describe the Bt cotton crop cultivated in India, with emphasis on the gene constructs, mode of action and its effect on cotton productivity in India. Using relevant statistics, discuss the challenges associated with cultivation of Bt Cotton.
2. Answer the following
   1. Write a note on Biostimulation, Bioaugmentation and Biofiltration (6 marks)
   2. What are bioreactors and their types? How they help in the wastewater treatment process. (4 marks)
3. How does downstream processing help in optimizing product yield? Explain with suitable examples.