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

**M.Sc. BIOTECHNOLOGY - II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2022**

**(Examination conducted in July 2022)**

**BT 8221: Genetic Engineering and Synthetic Biology**

**Time- 2 ½ hrs Max Marks-70**

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

**I.Part A: (Answer *ANY TEN* questions) 2 x 10 = 20 marks**

1. What advantages do BstI DNA polymerases have over other polymerases in practical use at genetic engineering?
2. What are adapters?
3. How is sonication used in DNA transformations?
4. Which enzyme can we use to remove phosphate groups from the DNA? What is the source for its isolation?
5. What is the principle behind the Gibson assembly method for cloning?
6. What is a biobrick assembly?
7. What is the function of origin of replication in vectors?
8. What is the function of IPTG in the blue-white screening procedure?
9. What is the use of Ponceau stain in Western blotting?
10. What are auxotrophs?
11. More the restriction sites in the MCS, the better is the vector. Justify.
12. What is SYBR green?

**II. Part: (Answer *ANY FIVE* questions) 6 x 5 = 30 marks**

1. The use of genes from different species in transgenic construction has always been problematic. But there are many examples which have attempted these types of transfers. State any one of the traits, its transgene with origin and two ethical concerns the transgenic would have.
2. How is biolistics used to transform DNA?
3. With an example explain the PCR based cloning.
4. Describe competitive ELISA in detail.
5. Explain the hybridisation technique used in construction of gene libraries.
6. Write a note on YACs with a suitable example.
7. Write a note on RNA interference technology.

**III. Part C: Answer the following 10 x 2 = 20 marks**

1. a. Explain the nomenclature, types and structural detail of restriction endonucleases.

**OR**

b. Describe the different procedures of selection of recombinant vectors in detail.

1. a. Describe the Sanger’s dideoxy chain termination method of sequencing.

**OR**

b. How is an expression vector constructed? Explain with suitable examples. Explain the role of promoters in construction of an expression vector. (6 + 4 marks)