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

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

**SEMESTER EXAMINATION: APRIL 2022**

**(Examination conducted in July 2022)**

**BT 8121: Molecular Genetics and Microbiology**

**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 is recombination frequency? How is it related to map distances?
2. What are LINES? What is the function of LINE-1?
3. What is Narrow sense heritability? Why is it better than Broad sense heritability?
4. What are gene pools? What gene pools are readily inter-matable?
5. Describe the role of condensins in epigenetics.
6. What is GWAS? What is the difference between GWAS and NGS?
7. How are genetic screens useful? What are the types of genetic screens?
8. Describe how nondisjunction helped prove chromosomal theory of inheritance.
9. Why is it useful to know about the normal flora of the human body?
10. What is a dichotomous key?
11. Which are the different classes of protozoans based on locomotion?
12. What is an exotoxin? What are the main roles exotoxins have in human disease pathogenesis?

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

1. Explain the evolution and features of gene families.
2. Using a suitable example, explain the multiple factor hypothesis.
3. Describe the utility of Zebrafish as a model organism in genetic studies.
4. Outline the procedure of FISH. State its advantages and disadvantages
5. Describe the fine structure of the *rII* locus in T4 phage.
6. Assume that two outbreaks of a bacterial disease occur in different areas of a city. How would you go about obtaining evidence that would confirm or negate the hypothesis that outbreaks are caused by the same bacterial strain?
7. What is 16s rRNA and why is it suitable for determining relatedness of microorganisms?

**Part C (Answer the following) 10mx2=20marks**

1. Explain in detail the various genomes that are present in an animal cell. Add a note on maternal inheritance.
2. What is the significance of the Human Genome Project? What are the ethical, social and legal issues involved in the HGP?
3. What are antibiotics? Explain the mode of action of the major groups of antibiotics with examples.