



Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
B.Sc. MICROBIOLOGY - IV SEMESTER
SEMESTER EXAMINATION: APRIL 2022

(Examination conducted in July 2022)

MB 418 - MICROBIAL GENETICS AND MOLECULAR BIOLOGY

Time- 1½ hrs

Max Marks-35

This question paper contains **1** printed page and **3** parts

I. Answer any Five of the following

5X2=10

1. What is conjugation? Is there any evolutionary significance to this process?
2. Write the composition of the prokaryotic ribosome.
3. List the various hypothesis proposed to explain replication of DNA.
4. What are the functions of: a. peptidyl transferase b. topoisomerase?
5. What are the salient features of B-form of DNA?
6. Name the scientist who discovered the following:
 - a. X- ray crystallographic structure of double helix of DNA
 - b. Autoradiographic theta structure of replicating DNA.
7. Differentiate between prokaryotic and eukaryotic mRNA.

II. Answer any Four of the following

4X5= 20

8. Describe the process of replication initiation in prokaryotes.
9. What are transposons? Describe the structure of a composite transposon.
10. How does UV rays mutate DNA? How can it be repaired?
11. Discuss the structure and function of (each part) the clover leaf model of tRNA.
12. Compare and contrast the arrangement of genetic material in prokaryotes and eukaryotes.
13. Differentiate between generalised and specialised transduction (make a tabular comparative chart).

III. Answer the following

1X5=5

14. a. In a genetics lab you are growing *E. coli* in a medium containing lactose and glucose, which sugar will the microbe use first and why? **2m**
b. If you transfer the *E. coli* cells from the above tube into medium containing only lactose, how will the microbe adapt? Explain using the lac operon system you have learnt as a basis of adaptation. **3m**