

Date:4-03-2022

Registration number:

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

MSc. MICROBIOLOGY - I SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in January-March 2022)

**MB 7321 – Microbial Genetics**

Time- 2 ½ hrs Max. Marks-70

This question paper contains one printed page and four parts

**I. Answer any Five of the following 5x3=15**

1. List one contribution each of Fredrick Griffith, Fraenkel-Conrat and Hershey-Chase.
2. What is DNA proof reading? Mention its significance.
3. Define mutant, revertant and mutational hotspot.
4. Does mutation contributes towards evolution? Give reasons.
5. Write a note on viral-like retro transposons.
6. Give an example of complementation system.
7. What are the applications of T7 bacteriophage in field of biological science?

**II. Answer any Five of the following 5x5=25**

1. With the help of a neat diagram write Avery, McLeod and McCarthy’s Experiment.
2. How is the Genome in prokaryotes organised?
3. What events occur at origin of replication during initiation of DNA replication in prokaryotes?
4. **A.** Draw a neat labelled diagram of F plasmid. **2.5**

**B.** Write features of Colicins producing plasmids. **2.5**

1. Describe any two mechanisms that can repair DNA damaged by UV radiations.
2. Describe Homologous recombination.
3. Draw structure of one each of the following: IS element, Composite and Noncomposite transposon.

**III. Answer any Two of the following 2X10=20**

1. Give a comparative account of the forms of DNA.
2. **A**. How does termination of replication occurs in prokaryotes? **3**

**B.** Illustrate specialised versus generalised transduction. **7**

1. **A.** Describe one process each for spontaneous and induced mutations. **5**

**B.** Illustrate lifecycle of M13 phage  **5**

**IV. Answer the following 1x10=10**

1. **A.** If deoxyribonucleotides that lack 3′-OH groups are added during replication process, what do you expect will occur? **3**

**B.** A pure culture that was subjected to UV radiations showed contrasting

colony morphology compare to that of control. Interpret the findings. **3**

**C.** Why was it important that Messelson and Stahl continue their experiment to at least two rounds of replication after isotopic labelling of the starting DNA with **15N** instead of stopping the experiment after only one round of replication? **4**