

BACHELOR OF SCIENCE (CBCS-2018 COURSE)
T. Y. B. Sc. Sem-V :SUMMER- 2022
SUBJECT : MICROBIOLOGY : GENETICS OF PROKARYOTES

Day : Monday
Date : 11/7/2022

S-18433-2022

Time : 11:00 AM-02:00 PM
Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Draw neat diagrams **WHEREVER** necessary.

Q.1 Attempt **ANY TWO** of the following : **(12)**

- a) Describe in brief the natural transformation system in *Streptococcus pneumoniae*.
- b) What are Hfr cells? Write the mechanism for formation of an Hfr cell from F⁺ cell.
- c) Define the term transduction and describe in brief Generalized transduction mediated by phage P22.

Q.2 Attempt **ANY TWO** of the following : **(12)**

- a) Describe the systems of conjugation in Gram negative bacteria.
- b) Describe the structure of trp operon w.r.t. following
 - i) Structural genes
 - ii) Attenuator region
 - iii) Dual control mechanisms.
- c) What are transposons? Write various types of bacterial transposons and their importance to cell.

Q.3 Attempt **ANY TWO** of the following : **(12)**

- a) Explain with a suitable diagram -Negative regulation of Lac Operon.
- b) Explain transposition mechanisms for a composite transposon.
- c) Explain the term competence. How do bacterial cells enter the stage of competence?

Q.4 Attempt **ANY THREE** of the following : **(12)**

- a) What would be the result of partial diploid of *E.coli*
 - i) F[']lacO^c LacZ⁺ / lacO⁺ lacZ⁺
 - ii) F[']lacO^c Lac Z⁺ / lacO⁺ lac Z⁻
- b) Write regulation of arabinose operon.
- c) Write in brief the structure of F plasmid and its properties.
- d) Write the operon model as described by Jacob and Monod.

Q.5 Write short notes on **ANY FOUR** of the following : **(12)**

- a) Lac mutants
- b) Discovery of transformation
- c) Retropoisons
- d) Phage conversion
- e) Conjugation without pili
