

**BACHELOR OF SCIENCE (CBCS-2018 COURSE)**  
**T. Y. B. Sc. Sem-VI :SUMMER- 2022**  
**SUBJECT : MICROBIOLOGY : GENETICS OF EUKARYOTES & GENE**  
**MANIPULATION**

Day : Saturday  
Date : 9/7/2022

**S-18489-2022**

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

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**N.B.**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the **RIGHT** indicate **FULL** marks.
  - 3) Draw neat and labeled diagram wherever necessary.
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**Q.1** Attempt **ANY TWO** of the following : **(12)**

- a) Explain the concept genetic maternal effect with example of shell coiling in snail *Limnea peregra*.
- b) What is recombinant DNA technology? Write the materials required to conduct RDT experiment.
- c) What is mRNA? How is mRNA used in constructing a c-DNA library? Write the significance of c-DNA library.

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

- a) Explain the following :-
  - i) Enzymes used in cutting of DNA
  - ii) Enzymes used in joining of DNA.
- b) What is F plasmid? Write the characteristic and role of F plasmid in gene transfer.
- c) Explain with a suitable diagram southern blotting. Write its applications.

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

- a) What are phages? Explain use of phages as cloning vectors.
- b) Explain the electroporation technique.
- c) Draw the diagram to demonstrate separation of DNA fragments using gel electrophoresis. Explain how will you determine the molecular size of the sample DNA in the gel?

**Q.4** Write short notes on **ANY THREE** of the following : **(12)**

- a) YAC vectors
- b) PCR
- c) Linkers and adaptors
- d) Gene bank
- e) Cloning vector in plants

**Q.5** Attempt **ANY FOUR** of the following : **(12)**

- a) State the genetic mechanism of Streptomycin resistance in *Chlamydomonas*.
- b) Seed plant of *Mirabilis jalpa* plant is crossed with green male plant. State the phenotype of progeny and write the reason.
- c) Write the working of gene gun.
- d) Write the characteristics of chloroplast DNA.
- e) What are transgenic animals? State any two examples of transgenic animals and the purpose of generating them.

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