

## Note:

1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labelled diagrams wherever necessary.
4. For Q 2, Q 3 and Q 4 attempt A and B OR C and D.

## Q.1

Do as directed: (Any fifteen)

1. \_\_\_\_\_ catalyzes the polymerization of nucleotide precursors into a DNA chain.
2. The direction of synthesis of the new DNA chain is only from \_\_\_\_\_ direction because of the properties of DNA polymerase.
3. The enzyme DNA polymerase I in *E. coli* is encoded by the \_\_\_\_\_ gene.
4. Replication of prokaryotic and viral DNA usually starts at a specific site on the chromosome called \_\_\_\_\_.
5. The physical untwisting of the DNA is catalysed by the enzyme \_\_\_\_\_.
6. The complex of the primase and the helicase with the DNA is called the \_\_\_\_\_.
7. In eukaryotes the enzyme \_\_\_\_\_ catalyzes the mitochondrial DNA replication.
8. State True or False: Nitrous acid is a Base modifying agent.
9. Define: Mutagen.
10. What is a tautomeric shift?
11. Give one example of a ionizing radiations inducing mutations.
12. Name the enzyme catalyzing Photoreactivation.
13. \_\_\_\_\_ is a regulator protein involved in induction of the SOS response.
14. Name of the plasmid present in *Agrobacterium tumefaciens*.
15. Role of multiple cloning site.
16. State True or false: Conjugation requires physical contact between two cells.
17. State True or false: Microinjection technique is used to introduce gene into a eukaryotic cell.
18. Give the name of one marker gene.
19. State any one role of DNA ligases.
20. Give one example of a Prokaryote used for cloning.



- Q 2 A Elaborate the key steps involved in DNA replication in prokaryotes. 08
- Q 2 B Explain Meselson and Stahl's experiment to prove replication of DNA is semiconservative. 07

OR

- Q 2 C Explain initiation of replication of DNA in Eukaryotes. 08
- Q 2 D Diagrammatically explain the model for reciprocal recombination. 07

- Q 3 A Define Mutation. Give general classification of Mutation. 08
- Q 3 B Explain Base Excision Repair. 07

OR

- Q 3 C Discuss various types of Base-pair substitution mutations. 08
- Q 3 D Diagrammatically explain mutagenic action of 5-bromouracil. 07

- Q 4 A How did Hershey and Chase prove that DNA is the genetic material of the cell? 08

- Q 4 B Discuss the Discovery of RNA as a genetic material. 07

OR

- Q 4 C Describe the features of pUC vector. 08

- Q 4 D Explain any one mode of gene transfer in prokaryotes. 07

Q.5 Write Short notes on: (Any three) 15

- a. SSB proteins.
- b. Rolling circle replication of DNA.
- c. Mutations caused by UV rays.
- d. Shuttle Vectors.
- e. Alkaline phosphatase- Source and uses.

