TIME: 2:30 HRS **MARKS: 75**

N.B: 1) All questions are compulsory.
2) Figures right to indicate full marks.

Q. 1] Do as directed: **(Any Fifteen)** 15

1. What is the function of helicase?
2. What are mutagens?
3. Name the scientists who designed pBR 322.
4. Name the enzymes that removes supercoiling in replicating DNA ahead of the replication fork.
5. Name the microorganism in which SOS response is best studied.
6. DNA replication is-------
   a) Conservative b) Non-conservative c) Semi-conservative d) None
7. The source of DNA ligase is _____.
8._____ mutagens act by inserting themselves between adjacent bases in one or both strands of the DNA double helix.
9. State whether following statement is True/ False: During DNA replication, nucleotides are added on to the 5' end of the growing DNA strand.
10. State true or False. AT → TA is a transversion mutation.
11. State true or False: Transduction is transfer of genetic material between bacterial cells via a phage.
12. Give one example of organisms commonly used for cloning.
13.Give one example of chemical mutagen.
14. Replication occurs once every cell generation during_____ phase of cell cycle.
15. Give the name of one marker gene.
16. Role of photolyase enzyme in photoreactivation.
17. Name the two radioactive isotopes used by Hershey and Chase in their experiment.
18. What is nonsense mutation?
19. The enzyme that stitches Okazaki fragments together (along the lagging strand) is called--------.
20. Name one gene transfer technique for Prokaryotes.

Q.2 A] Explain initiation of replication in *Escherichia Coli.* 08

Q.2 B] Describe the Meselson Stahl experiment, and explain how it showed that DNA replication is semiconservative. 07

OR

Q.2 C] Explain with a suitable diagram model of reciprocal recombination. 08

Q.2 D] In detail explain rolling circle replication. 07

Q.3 A] Explain the term mutation and elaborate on overall classification of mutation. 08

Q.3 B] Describe the action of 5-bromouracil as mutagenic agent. 07

OR

Q.3 C] Explain base pair substitution. Discuss types of base pair substitution mutation. 08

Q.3 D] In detail explain photo reversal DNA repair. 07

Q.4 A] Describe an experiment to prove that DNA is the genetic material. 08

Q.4 B] Elaborate on the features of Type II Restriction Endonucleases. 07

OR

Q.4 C] Describe Griffith's experiment to prove that DNA is the genetic material. 08

Q.4 D] Describe the features of the plasmid vector pBR 322. 07

Q.5. Short notes **(Any 3)** 15

a. Expression vectors.

b. DNA ligase.

c. Role of Telomerase

d. Intercalating agents

e. Biological mutagens

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