

Seat No. : _____

JG-123

January-2021

B.Sc., Sem.-V

CC-301 : Microbiology

(Molecular Biology & Genetics of Prokaryotes)

(Old Syllabus)

Time : 2 Hours]

[Max. Marks : 50

- Instruction :**
- (1) Students should write the answers from the question paper applicable to them; either “**New Course**” or “**Old Course**” and it must be mentioned at the beginning of the answer paper.
 - (2) Answer any **three** questions out of **eight** questions. Question No. **9** is compulsory.
 - (3) Draw figures wherever necessary.
 - (4) Figures to the right indicate marks.

1. Describe different experiments that convinced that DNA is a genetic material. **14**
2. (A) Discuss the structure of DNA. **7**
(B) Explain the following events of DNA replication with diagram : **7**
 - (1) formation of initiation complex
 - (2) leading and lagging strands
 - (3) proof reading
3. Explain with diagram the process of translation in *Escherichia Coli*. **14**
4. (A) Describe salient characters of genetic code. **7**
(B) Explain the role of cAMP and CAP in regulation of *lac* operon. **7**
5. Explain the following: Reverse mutation, nonsense mutation, frame-shift mutation, transversion and conditional lethal mutation. **14**
6. (A) Write short note on transposons. **7**
(B) Describe in detail direct and indirect repair mechanisms. **7**

7. Explain in detail the following events and differentiate between them : 14
 $F^+ \times F^-$, $Hfr \times F^-$ and $F' \times F^-$
8. (A) Discuss the process of transduction in bacteria. 7
(B) Enlist and describe different types of plasmids. 7
9. Give short and specific answers in **1-2** lines only : (any **eight**). 8
- (1) Define allele.
 - (2) What is genotype ?
 - (3) Which were the two different elemental radioactive isotope we utilized by Hershey and Chase in their experiment that verified genes were made of DNA ?
 - (4) Name the technique used by Rosalind Franklin, which provided crucial clues to the Watson-Crick DNA model.
 - (5) Write the diagrammatic flow-sheet of central dogma.
 - (6) Name the enzyme needed for unwinding of DNA during transcription.
 - (7) Which enzyme formylates the amino acid during the process of initiation of translation ?
 - (8) What are Shine-Delgarno sequences ?
 - (9) Define diauxic growth curve.
 - (10) What types of mutation results due to addition or deletion of nucleotides in an intron ?
 - (11) What are transposons ?
 - (12) Define auxotrophs.
 - (13) In which phase of bacterial growth cycle the competence is usually obtained ?
 - (14) Which type of plasmid imparts the ability to carry out conjugation ?
 - (15) Name the genes that are picked up by lambda phage from E.coli during specialized transduction.
 - (16) What is the status of F ?
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