

Seat No. : _____

NB-103

December-2015

B.Sc., Sem.-V

**Core Course- 301 : Microbiology
(Molecular Genetics of Prokaryotes)**

Time : 3 Hours]

[Max. Marks : 70

- Instructions :** (1) All questions carry equal marks.
(2) Draw diagrams wherever necessary.

1. Answer the following : (any **two**) **14**
- (a) Explain molecular mechanism of DNA replication.
 - (b) Explain in detail the Watson and Crick model of DNA.
 - (c) How does Hershey and Chase experiment prove that DNA is genetic material in viruses ?
 - (d) Differentiate between :
 - (1) RNA and DNA
 - (2) Zygote and Merozygote
 - (3) Intron and Exon
2. Answer the following : (any **two**) **14**
- (a) Explain role of σ (sigma) factor in initiation of transcription.
 - (b) Explain *lac* operon as an example of negative inducible control.
 - (c) Describe the process of elongation of translation.
 - (d) What is genetic code ? Explain degeneracy and wobble nature of genetic code.
3. Answer the following : (any **two**) **14**
- (a) Explain acridine orange and U.V. radiation as mutagenic agent.
 - (b) Replica plate technique and its significance.
 - (c) Describe various types of mutations and their significance.
 - (d) Explain the mechanism of SOS repair in prokaryotes.

4. Answer the following : (any **two**) **14**
- (a) Differentiate generalized transduction and specialized transduction.
 - (b) What is competence ? Explain mechanism of transformation in Gram negative bacteria.
 - (c) Explain various types of plasmids and their role in prokaryotic gene expression.
 - (d) What are transposons ? Explain mechanism of transposition in prokaryotes.
5. Answer in **one** or **two** lines : **14**
- (a) Name nitrogenous bases found in DNA molecule.
 - (b) What is a cistron ?
 - (c) Mention function of DNA gyrase.
 - (d) What is TATA box ? Mention its importance.
 - (e) Mention function of rho-protein.
 - (f) What is an operon ?
 - (g) Draw central Dogma of genetic information.
 - (h) Name key enzyme responsible for photoreactivation.
 - (i) Write application of Ames's test.
 - (j) What is an APsite ?
 - (k) Name one biological mutagen.
 - (l) F plasmid is an episome. what do you mean by it ?
 - (m) What is F^+ , F^- and HFr ?
 - (n) What do you mean by Horizontal Gene transfer ?
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