

Seat No. : \_\_\_\_\_

**N13-115**  
**November-2014**  
**B.Sc., Sem.-V**  
**MI-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 work of Griffith as experimental proof for DNA as genetic material.
  - (b) Explain in detail the Watson and Crick model of DNA.
  - (c) Define gene and describe gene structure and function.
  - (d) Describe formation of primosome and replisome at molecular level.
  
2. Answer the following : (Any **two**) **14**
  - (a) Explain termination of transcription.
  - (b) What do you mean by positive and negative control of gene regulation ? Explain tryptophan operon as an example of gene regulation.
  - (c) Initiation of translation.
  - (d) What is genetic code ? Explain salient features of genetic code.
  
3. Answer the following : (Any **two**) **14**
  - (a) Molecular mechanism of mutagenesis by U.V. radiation.
  - (b) Role of Rec-A protein in repair mechanism.
  - (c) Discuss mechanism of SOS repair in prokaryotes.
  - (d) Explain the mechanism of frame-shift mutagenesis, its cause and its effect at the level of protein synthesis.

4. Answer the following : (Any **two**) **14**
- (a) Write a note on generalized transduction.
  - (b) What is competence ? Explain mechanism of transformation of Gram negative bacteria.
  - (c) Role of F plasmid in bacterial conjugation.
  - (d) What are transposons ? Explain mechanism of transposition in prokaryotes.
5. Answer in **one** or **two** lines : **14**
- (a) List three enzymes involved in DNA replication.
  - (b) Draw general formula of a nucleotide molecule.
  - (c) Name initiation codon and mention the amino acid coded by it.
  - (d) What is degeneracy of genetic code ?
  - (e) Mention energy expenditure in translation process.
  - (f) Differentiate DNA pol and RNA pol.
  - (g) Mention direction of following :
    - (i) Transcription
    - (ii) Translation
  - (h) Name enzyme involved in light repair.
  - (i) What is the role of *lexA* protein in the SOS response ?
  - (j) What are transversion mutations ?
  - (k) What is an episome ?
  - (l) What is plasmid copy number ?
  - (m) What is transfection ?
  - (n) Draw the fate of merozygote.
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