

Seat No. : _____

MB-111

March-2018

B.Sc., Sem.-V

CC-301 : Microbiology (Molecular Genetics of Prokaryotes)

Time : 3 Hours]

[Max. Marks : 70

- Instructions :** (1) Draw figures wherever necessary.
(2) Mention correct question number against each answer.
(3) Figures to the right indicate marks.

1. Answer the following (any two) : 14
- (A) Define and explain the following terms :
- (i) Allele
 - (ii) Plasmid
 - (iii) Exon
 - (iv) Merozygote
- (B) Describe the experiment which demonstrated that the genetic material of phage is DNA.
- (C) Explain in detail the structure and the functions of a typical gene.
- (D) Explain in short the following process during DNA replication:
- (i) Formation of replisome.
 - (ii) Importance of proof reading.
2. Answer the following (any two) : 14
- (A) Describe the role of DNA dependent RNA polymerase and rho factor in prokaryotic transcription.
- (B) Discuss various important features of genetic code.
- (C) Explain role played by various RNAs in translation.
- (D) Describe the regulation of *lac* operon in presence of glucose together with lactose.
3. Write short note on the following (any two) : 14
- (A) Spontaneous nature of mutation.
 - (B) Mutagenic action of acridine orange.
 - (C) Silent, missense, non-sense and frame shift mutations.
 - (D) SOS regulatory system.

4. Answer the following (any **two**) :

14

- (A) What is horizontal gene transfer ? Explain the process of Hfr × F⁻ cross.
- (B) Discuss the process of seduction. How does it differ from transduction ?
- (C) Discuss different types of plasmids and their significance for the bacterial cells.
- (D) Compare and differentiate IS and Tn. Explain their significance.

5. Give short and specific answers in 1-2 lines only :

14

- (1) Who discovered the DNA structure ?
- (2) Name two processes by which the information present in DNA is converted into proteins.
- (3) What is Shine-Dalgarno sequence ?
- (4) What is the direction of DNA synthesis ?
- (5) Name four arms of tRNA.
- (6) On which DNA strand the Okazaki fragments are formed ?
- (7) What are frame shift mutations ?
- (8) What are the different regions/components of operon ?
- (9) Name two processes where in the genetic information is horizontally transferred from one bacterium to another without using a pilus.
- (10) What is λdg ?
- (11) Who discovered mobile genetic elements ?
- (12) The partial diploids formed as a result of sexual reproduction in bacteria is known as _____.
- (13) Give the difference between nucleotide and nucleoside.
- (14) Name nucleotide triplet of amber codon.
