

B.Sc. (Hons.) Bio-Informatics 3rd Semester
BIN-3001: Fundamentals of Molecular Biology & Genetics Engineering-I

Time Allowed: 3 hours

Max. Marks: 80

Note: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each unit.

- I. Answer the following questions:
- What is the role of DNA Polymerase-I in DNA replication?
 - Briefly discuss the experiment that proved DNA replication is semi-conservative.
 - What is the size of okazaki fragments and why are they synthesized?
 - Briefly explain photo-reactivation repair.
 - What is a co-repressor? Give suitable examples.
 - What are transcription factors?
 - Differentiate between anabolite and catabolite.
 - What is the fate of histone proteins during DNA replication? (8x2)

UNIT-I

- II. a) How is DNA replicated?
b) Compare and contrast semi-conservative and conservative replication. (8,8)
- III. a) What is SOS repair?
b) Explain the process of repair of pyrimidine dimers. (8,8)
- IV. a) Why is one strand of DNA synthesized continuously and other in fragments?
b) Discuss the various enzymes/proteins and their functions which are involved in DNA repair. (8,8)
- V. a) Discuss holiday model of DNA replication.
b) Discuss enzymes and steps involved in post-replication repair. (8,8)

UNIT-II

- VI. a) Discuss repressible operon.
b) How are enzymes induced and repressed? (8,8)
- VII. a) Discuss catabolite repression.
b) Enlist the various components of RNA Polymerase and give their functions. (8,8)
- VIII. a) Explain constitutive synthesis of enzymes.
b) Discuss the mechanism of transcription. (8,8)
- IX. a) What are the different types of RNA and their functions.
b) Explain any inducible operon. (8,8)
