

2012
B.A./B.Sc. (General) Third Semester
Bio-Informatics
BNE-3002: Fundamentals of Molecular Biology – I

Time allowed: 3 Hours

Max. Marks: 67

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit

x-x-x

1. Answer the following:-

(10x1½)

- i. Enlist the enzymes involved in replication of dsDNA.
- ii. What is DNA proof reading?
- iii. Give an overview of transcription.
- iv. Explain base excision repair mechanism.
- v. What is the role of RNA primase in DNA replication?
- vi. Give function of different type of DNA polymerase enzymes.
- vii. During replication, Okazaki fragments elongate
 - (a) leading strand towards the replication fork
 - (b) lagging strand towards the replication fork
 - (c) leading strand away from the replication fork
 - (d) lagging strand away from the replication fork
- viii. Which of the following helps in opening of DNA double helix in front of replication fork?
 - (a) topoisomerase
 - (b) DNA polymerase-I
 - (c) DNA gyrase
 - (d) DNA ligase
- ix. DNA polymerase synthesizes
 - (a) DNA in 5'-3' direction
 - (b) DNA in 3'-5' direction
 - (c) mRNA in 3'-5' direction
 - (d) mRNA in 5'-3' direction
- x. The fragments of DNA are joined together by which of the following enzymes?
 - (a) Endonuclease
 - (b) DNA polymerase
 - (c) Primase
 - (d) Ligase

P.T.O.

(2)

UNIT - I

- 2 (a). Explain DNA Polymerase along with their activity? 7
 (b). Explain role of gyrase and topoisomerase in replication? 6
- 3 (a). Difference between leading and lagging strand? 7
 (b). Explain SOS repair system and its importance? 6
- 4(a). What is replication fork? 7
 (b). What are the bonds involved in stabilizing dsDNA and how are they broken during replication? 6
- 5(a). What is semiconservative mode of DNA replication? 7
 (b). What are Okazaki fragments? 6

UNIT - II

- 6(a). Discuss the various components of RNA polymerase. 7
 (b). Explain regulation of Lac operon in the absence and the presence of its inducer. 6
- 7(a). Discuss the Trp operon and its regulation 10
 (b). How can you differentiate between RNA polymerase of prokaryotes and eukaryotes? 3
- 8(a). Discuss regulation of histidine operon. 8
 (b). How does elongation take place during transcription? 5
- 9(a). How does termination of transcription occur in eukaryotes? 6
 (b). Differentiate between the regulation of repressible and inducible operon. 7