Exam.Code:0006
Sub. Code: 17556

2055

B.A./B.Sc. (General) Sixth Semester

Bio-Chemistry

Paper – A: Molecular Biology –II

Time allowed: 3 Hours Max. Marks: 45

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

x-x-x

1. Attempt the following:-
   a) Name two types of RNA modifications.
   b) What are enhancers?
   c) What is the function of the operator region in operons?
   d) Name two types of non-coding RNAs.
   e) What are nucleosomes?
   f) State the role of bacteriophages in molecular biology.
   g) What are single nucleotide polymorphisms (SNPs)?
   h) Name two genetic disorders associated with mutations.
   i) Define gene cloning. (9×1)

UNIT - I

II. a) Explain the process of central dogma in molecular biology.
   b) Describe the regulation of the Tryptophan operon. (5,4)

III. a) Define the lytic cycle and differentiate between lytic and lysogenic cycles in viruses.
   b) Explain the process of protein translocation into mitochondria. (5,4)

UNIT - II

IV. a) Describe the transcription process in eukaryotes.
   b) What is mRNA processing? How does it regulate gene expression? (4,5)

V. a) Explain how steroid hormones control gene expression.
   b) What is a zinc finger motif? Describe its role in gene regulation. (5,4)

UNIT - III

VI. a) What are cloning vectors? How are plasmids used as gene carriers in genetic engineering?
   b) Define restriction enzymes and explain their role in gene cloning. (5,4)

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VII. a) Describe the process of gene isolation from a prokaryotic cell.

b) Discuss the applications of genetic engineering. (4,5)

UNIT - IV

VIII. a) Outline the main structural features of the eukaryotic genome.

b) What is next-generation sequencing? Explain the Sanger method of genome sequencing. (5,4)

IX. a) Explain the applications of DNA fingerprinting.

b) What is a microarray? Describe its role in genetic disease diagnosis. (4,5)

x-x-x