B. Tech.

(SEM. IV) EXAMINATION, 2006-07

GENETICS & MOLECULAR BIOLOGY

Time: 3 Hours] [Total Marks: 100

Note: Attempt all five questions.

1. Attempt any four parts of the following: 4x5=20
   (b) How genes present on single chromosome can be mapped? Under what circumstances two genes A and B present on single chromosome will assort independently?
   (c) Define law of independent assortment. Explain parallelism behaviour with meiosis.
   (d) Explain extra chromosomal inheritance?
   (e) Explain recessive, dominant, homozygous and heterozygous alleles. Define what are alleles.

2. Attempt any four parts of the following: 4x5=20
   (a) What are IS elements and transposes? Why are they called selfish DNA?
   (b) How proof reading occurs during DNA replication? Explain.

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(c) Write distinguishing features of B-form of DNA? Who discovered B-DNA?

(d) How UV rays causes mutation? Explain. Discuss UV-induced repair of DNA?

(e) How can you isolate auxotrophic mutants of E-coli?

3. Attempt any two parts of the following: \[2 \times 10 = 20\]

(a) Give structure and function of different types of DNA polymerases? What is their role?

(b) What are Okajaki fragments? What is the function of DNA gyrase and topoisomerase?

(c) Who discovered reverse transcriptase? What is role and significance? Explain.

4. Attempt the following: \[1 \times 20 = 20\]

How does transcription differ in Prokaryotes and Eukaryotes? What do you understand by post transcriptional modification?

5. Attempt any two parts of the following: \[2 \times 10 = 20\]

(a) What is triplet code? Give its major characteristics.

(b) Describe protein synthesis in prokaryotes? List major differences between eukaryotes.

(c) How are genes regulated? Why is it necessary? What are constitutive and inducible genes? Explain and give suitable examples.