

Roll No. ....

Total Pages : 3

**10812**

**LMDQ/D-23**  
**MOLECULAR GENETICS**  
**Paper : BT-303**

Time : Three Hours]

[Maximum Marks : 80

**Note :** Candidates are required to attempt Q. No. 1 and *four* others selecting *one* question from each unit.

**Compulsory Question**

1. Define and explain the following :

- (a) Antitermination.
- (b) Repression.
- (c) Ortholog.
- (d) RNA interference.
- (e) Cryptic genes.
- (f) Microsatellites.
- (g) Polymorphism.
- (h) Transcriptome.

(8×2=16)

**UNIT-I**

2. Write short notes on :

- (a) Single cell gel electrophoresis.
- (b) G and C banding.

(c) Induced DNA damage.

(d) Multigene families. (4×4=16)

3. Describe briefly :

(a) Human genome organization.

(b) Genotoxicity test systems. (6,10)

## UNIT-II

4. What is positive regulation of genes? Discuss with examples from lactose, arabinose operons in *E. coli* and lambda phage. (16)

5. Describe briefly :

(a) Silencing of gene in eukaryotes is mediated by deacetylation and methylation.

(b) mi RNA and si RNA.

(c) Riboswitches.

(d) Attenuation. (4×4=16)

## UNIT III

6. Describe briefly :

(a) Recombinases and its types.

(b) STS mapping.

(c) Shot gun sequencing.

(d) FISH. (4×4=16)

7. What is genome mapping? Discuss different DNA markers used for genome mapping along with their advantages and disadvantages. (16)

#### UNIT-IV

8. Discuss briefly :
- (a) SAGE.
  - (b) Exon shuffling.
  - (c) Molecular breeding of biosynthetic pathways.
  - (d) DNA chips. (4×4=16)
9. (a) What is metabolic engineering? Discuss the different approaches used for metabolic engineering and illustrate them with suitable examples. (12)
- (b) Comparative genomics of eukaryotes. (4)
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