

Roll No.

Total Pages : 03

CMDQ/D-23

6547

MOLECULAR BIOLOGY-II

BCH-301

Time : Three Hours]

[Maximum Marks : 80

Note : Question No. **1** is compulsory. Attempt *four* more questions selecting *one* question from each Section. Each question carries 16 marks.

1. (i) What are housekeeping genes ? Discuss about them by giving suitable example.
- (ii) Define epigenetics and its role in the regulation of gene expression.
- (iii) Write a note on significance of transposable elements.
- (iv) Discuss the reactions of formaldehyde with Guanine.
- (v) Differentiate carcinoma from sarcoma.
- (vi) Discuss about telomerase expression and its role in cancer.
- (vii) What is syncytial blastoderm ? How is it changed into blastula ?

- (viii) What is a physical map ? Name some physical markers. $2 \times 8 = 16$

Unit I

2. (a) What is gal operon ? Describe various mechanisms for its regulation.
(b) Discuss the structure of leucine zipper motif. $12 + 4 = 16$
3. (a) Describe in detail about the lytic and lysogenic mechanisms of regulation of gene expression in phages.
(b) Discuss the role of RNA splicing in the regulation of gene expression. $12 + 4 = 16$

Unit II

4. (a) Discuss about replicative and non-replicative transposition. Describe the transposable elements in bacteria.
(b) Write a note on P elements of *Drosophila*. $12 + 4 = 16$
5. (a) Discuss the photochemical modifications of nucleic acids.
(b) Discuss the effects of ionizing radiations on nucleic acids. $8 \times 2 = 16$

Unit III

6. (a) Write a note on important characteristics of cancerous cells.
(b) Discuss about tumor suppressor genes and how they prevent onset of cancer. $8 \times 2 = 16$
7. Write notes on the following : $5 + 5 + 6 = 16$
- (a) Chemical carcinogens, their types and mechanism of causing cancer
(b) Cell cycle control proteins and their role in prevention of onset of cancer
(c) DNA viruses and mechanism of causing cancer.

Unit IV

8. Describe in detail about various pattern control genes and their role in *Drosophila* development. 16
9. Write notes on the following : $6 + 5 + 5 = 16$
- (a) Describe various genetic markers and their role in the field of genomics.
(d) DNA microarray technique and its applications.
(c) Evolution of genomes in cereal grasses.