

[Time: 2½ Hours]

[Marks:60]

Please check whether you have got the right question paper.

- N.B:**
1. All questions are **compulsory**.
 2. Choice is **internal**
 3. From **QI** to **QIV**, attempt any one out of (i) and (ii)
 4. For **QV** attempt any one of a & b, c & d, e & f, g & h.
 5. Draw flow charts/ diagrams wherever necessary
 6. **Figures** to the **right** indicate **full marks**

- I** A Define **any one** of the following: **02**
- i) Gene repression
 - ii) Exons
- B Attempt **any one** of the following: **04**
- i) Write a brief note on genetic counseling.
 - ii) Define an operation. Schematically represent the functions of *lac* operon in prokaryotes.
- C Write a note on **any one** of the following: **06**
- i) Write briefly on prokaryotic gene regulation. Elaborate on SOS regulation.
 - ii) The role of cis-trans acting elements in eukaryotic gene expression with examples and evidences.
- II** A Define/ explain **any one** of the following: **02**
- i) Mutagenesis
 - ii) Turner's syndrome
- B Attempt **any one** of the following: **04**
- i) "Mutations can be of various types". Justify
 - ii) Give a brief account of aberrations occurring in chromosomes.
- C Write briefly on **any one** of the following: **06**
- i) "Chromosomal abnormalities can be structural and numerical". Justify
 - ii) What are the various DNA repair mechanisms? Elaborate on any two of them.
- III** A Define /explain **any one** of the following **02**
- i) Role of DNA methylases
 - ii) Karyotyping

[Turn Over]

B Write briefly on **any one** of the following:

- i) What are the various enzymes that degrade nucleic acids? Elaborate on mode of actions of any one.
- ii) RFLP and its applications.

04

C Write short notes on **any one** of the following:

- i) Write a note on DNA sequencing methods. Elaborate on any one of them.
- ii) Write a brief note on the techniques based on nucleic acid hybridization.

06

IV A Define/explain /answer **any one**:

- i) What is a gene Bank?
- ii) Yep and its significance.

02

B Answer **any one** of the following:

- i) "Various vectors are used for cloning in animal cells". Justify.
- ii) Write briefly on ethical and legal issues of Human Genome Project.

04

C Answer **any one** of the following:

- i) Elaborate on transformation techniques used in gene cloning.
- ii) Write a note on agricultural and industrial applications of recombinant DNA technology.

06

V Answer the following briefly:

a. What is the concept of split genes?

03

OR

b. Explain gene attenuation.

c. Explain chromosomal disomies and trisomies

03

OR

d. Briefly explain the Ames test.

e. Write briefly on restriction endonucleases and their significance.

03

OR

f. RAPD and its significance.

g. Explain briefly c DNA and its synthesis

03

OR

h. T_i plasmid and its role in gene cloning.