This question paper contains 3 printed pages.]

Your Roll No. .....

1298 **A**

B.Sc. (Hons.)/I

BOTANY—Paper III

(Cell and Molecular Biology)

(Admissions of 2004 and onwards)

Time : 3 *Hours* *Maximum Marks* : 38

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt ***five*** *questions in all, including Q. No.* **1** *which is compulsory.*

1. (a) Fill in the blanks : $6 \times \frac{1}{2} = 3$

(i) Highest number of chromosome among the plants is seen in ..... .

(ii) Inulin is a polymer of ..... .

(iii) Each turn in α–helix has ..... amino acid residues.

(iv) Mitochondria are stained with ..... .

(v) A prolonged diplotene is seen in ..... chromosomes.

(vi) During progression of cell cycle, a cell commits to divide at ..... phase.

(b) Give the structural formula of any ***six*** : $6 \times \frac{1}{2} = 3$

(i) ATP

(ii) Sucrose

(iii) Deoxyribose

(iv) 5'-3' phosphodiester bond

(v) Lactose

[P.T.O.

(vi) Glycine

(vii) Cellulose

(viii) Cytosine

2. (a) Give the contribution(s) of any ***four*** of the following : $4 \times \frac{1}{2} = 2$

(i) H. Frankal Conrat

(ii) R. Brown

(iii) F. Griffith

(iv) R. Hooke

(v) E. G. Balbiani

(vi) Christian de Duve

(b) Mention the location of any ***four*** of the following : $4 \times \frac{1}{2} = 2$

(i) Cytochrome P-450

(ii) DNA Polymerase

(iii) Rubisco

(iv) Pyruvic acid dehydrogenase

(v) Adenylate Kinase

(vi) D-amino acid oxidase

(c) Describe the various stages of meiosis with the help of diagrams. 4

3. Differentiate between any ***four*** of the following : $4 \times 2 = 8$

(i) B-DNA and Z-DNA

(ii) Freeze fracture and Free etching

(iii) Euchromatin and Heterochromatin

(iv) Light Microscopy and Electron Microscopy

(v) Reducing and Non-reducing sugar

(vi) Primary cell wall and secondary cell wall

4. (a) Describe genetic recombination in bacteria. 4

(b) Give a brief account of structure and function of Ribosomes. 4

OR

How are autotriploids raised ? What is their agricultural significance ?

5. Write short notes on any ***four*** of the following : (4 × 2 = 8)

(a) Negative staining

(b) Chromosome painting

(c) Cell cycle

(d) DNA/RNA hybridization

(e) Density gradient centrifugation

(f) Reciprocal translocations

6. Explain any ***four*** of the following : (4 × 2 = 8)

(a) Monosomy

(b) Significance of Mitosis

(c) Significance of proline in protein structure

(d) Paracentric inversions

(e) Nuclear Pore Complex

7. (a) Describe the molecular mechanism of DNA replication. 4

(b) With the help of a labelled diagram, explain the structure of Mitochondria. Describe its function. 4

OR

Discuss the role of chromosomal aberrations in cancer.