

This question paper contains 4 printed pages]

Your Roll No.....

933

B.Sc. (Hons.)/I

C

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.

Q. No. 1 which is compulsory.

1. Attempt any *five* of the following : 5×2=10
- (a) Give *two* advantages of electron microscopy over light microscopy.
 - (b) What would be the net charge on a protein molecule having more acidic amino acids than basic amino acids ?
 - (c) Give a structural formula of phospholipids to show its bipolar nature.

P.T.O.

- (d) What is autoradiography ? Give *one* example of its use in cell biology.
- (e) What is the relationship between a codon and an anticodon ?
- (f) What feature of inner membrane of mitochondrion is related to its high metabolic activity ?
- (g) What do you mean by melting point of DNA ? Why two helices of DNA with same number of base pairs may have different melting points ?
- (h) What is the relationship between the resolution power of a microscope and the wavelength of the illumination ?
- (i) Name *two* aromatic amino acids.
2. (a) Distinguish between any *two* : 2×3=6
- (i) Autophagy and heterophagy
 - (ii) Microtubules and microfilaments
 - (iii) Autopolyploidy and allopolyploidy
 - (iv) Glycogen and amylopectin.
- (b) Why is the linkage between *two* nucleotides of a nucleic acid called phosphodiester bond ? 1

3. (a) Write short notes on any two : 2×3=6
- (i) Golgi complex
 - (ii) Karyotype
 - (iii) Nucleosome
 - (iv) Quaternary proteins.
- (b) Expand the terms TEM and SEM. 1
4. Give a detailed account of structure and organization of proteins. Also list their important functions. 7
5. (a) Describe briefly the structure and function of nuclear pore complex. 3
- (b) Define the terms—monosomy, nullisomy, trisomy and tetrasomy. 4
6. (a) Write in detail the differences between a prokaryotic cell and eukaryotic cell. 5
- (b) Give a brief description of synaptonemal complex. 2

7. Give the location and function of each of the following : 7
- (a) Catalase
 - (b) Succinic dehydrogenase
 - (c) Telomere
 - (d) Centromere
 - (e) Oxysomes
 - (f) Aquaporins
 - (g) Glycoproteins.
8. (a) Write explanatory notes on peroxysomes and glyoxysomes. 4
- (b) Give *one* contribution of each of the scientist :
J. Cairns, M. Swett, E.G. Balbioni, C. Benda, K.R. Porter
and J.B. Farmer. 3