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Your Roll No.

5864

B.Sc. (Hons.)/(Botany/Biochemistry/Microbiology/

Anthropology/Zoology)/III Sem. B

Paper CBHT-301 : CELL BIOLOGY—I

Time : 3 Hours

Maximum Marks : 75

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

Answer *five* questions in all, including

Q. No. 1, which is compulsory.

I. (a) Explain any *three* of the following :

- (i) Viroids
- (ii) Amphipathic molecules
- (iii) Limit of resolution
- (iv) Functions of peroxisomes
- (v) HSP70
- (vi) Kinetochore.

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P.T.O.

(b) Name the organelle in which the following enzymes are located (attempt any *three*) :

(i) Cytochrome oxidase

(ii) Catalase

(iii) Glycosidases

(iv) Signal peptidase

(v) Rubisco.

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(c) Name the technique used for the following (attempt any *four*) :

(i) To determine the size and granularity of the cell using laser light.

(ii) Image of the sample is formed by the sharply focussed light which is allowed to pass through a pinhole in the screen.

(iii) Separation of protein biomolecules on the basis of their size.

(iv) To determine structure of proteins and nucleic acids.

(v) To observe living cells.

(vi) To examine surface of the object with the help of electrons.

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(d) Comment on any *three* of the following :

(i) Autophagy.

(ii) Signal sequence

(iii) Facultative heterochromatin

(iv) Clathrin

(v) Mycoplasma.

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2. Give comparative account of any *four* of the following :

(i) α -helix and β -pleated sheet structure of proteins

(ii) Prokaryotic and eukaryotic cell

- (iii) Intermediate filaments and microfilaments
- (iv) *Cis* and *trans* face of Golgi body
- (v) Paper chromatography and thin layer chromatography
- (vi) Phosphoglyceride and sphingolipids. 3½×4=14

3. Attempt any *two* of the following :

- (a) Outline the basic method of cell fractionation to isolate different cell components. How use of density gradient centrifugation will help to get pure fractions.
- (b) Describe functions of SER and RER.
- (c) How are proteins imported into the mitochondrial matrix ? 2×7=14

4. Write short notes on any *four* of the following :

- (a) Nucleosome
- (b) Semiautonomous nature of mitochondria

- (c) Transmembrane proteins
- (d) Freeze fracture technique
- (e) Affinity chromatography
- (f) COPI-coated vesicles.

3½×4=14

5. Answer any *two* of the following :

- (a) Discuss nucleo-cytoplasmic exchange through nuclear pore complexes.
- (b) Draw labelled diagram of a mitochondria.
- (c) Describe the relationship between nucleolar organizing region of chromosome and the biogenesis of rRNA.

2×7=14

6. (a) Write the full form of the following :

- (i) *E.coli*
- (ii) MTOCs

(iii) STEM

(iv) TMV

(v) rpm

(vi) NLS

(vii) snoRNA.

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(b) Discuss general principle involved in fluorescence microscopy. 7

7. (a) Write on role of microtubules in cell functions. 7

(b) Name the following :

(i) Heavy metal stain used in Electron microscopy.

(ii) Two basic amino acids present in histones.

(iii) Serine containing membrane lipids.

(iv) A virus for which host cell is a bacterium.

(v) A protein having quaternary structure.

- (vi) Scientist who determined the amino acid sequence of insulin.
- (vii) Motor proteins that moves along actin containing microfilaments and help in movement of muscles/ cytokinesis etc.

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