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Your Roll No.

654

B.Sc. (Hons.)/ B.Sc. Prog. Chemistry/II Sem. A

Paper—LSPT-202

Biology—II—Cell and Cellular Process

(Admission of 2010 and onwards)

Time : 3 Hours

Maximum Marks : 75

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

Answer Sections A and B on separate answer-books.

Section A : Answer *three* questions including question No. 1 which is compulsory.

Section B : Answer *three* questions including question No. 1 which is compulsory.

Section A

I. Answer the following :

(a) Give the full form of any *two* of the following : $\frac{1}{2} \times 2 = 1$

(i) PPLO

(ii) TEM

(iii) TMV.

P.T.O.

(b) Differentiate between any *two* of the following : $3 \times 2 = 6$

(i) Chromosome and chromatid

(ii) Centrosome and centromere

(iii) Gram negative and gram positive bacteria.

(c) Classify the following as—Double membrane bound organelles, single membrane bound organelles and Non-membranous organelles :

Peroxisomes, Lysosomes, Ribosomes, Chloroplasts,
Glyoxisomes, Mitochondria. $\frac{1}{2} \times 6 = 3$

2. (a) Briefly describe the cell theory. 4

(b) Outline the process of meiosis in an animal cell with the help of well-labelled diagrams. 6

(c) Justify the statement, 'the eukaryotic cell cycle is regulated by a molecular control system'. 4

3. (a) What is meant by the limit of resolution of a microscope ? How can the resolving power of a microscope be improved ? 4

(b) Explain the structure and working of scanning electron microscope. Add a note on its applications in biological studies. 6

(c) What is the role of mitosis in living organisms ? 3

4. Write short notes on any *four* of the following : $3\frac{1}{2} \times 4 = 14$

(a) Sample preparation for light microscopy

(b) Cell fractionation

- (c) X-ray diffraction analysis
- (d) M-phase of the cell cycle
- (e) Freeze-fracturing.

Section B

I. (a) Fill in the blanks : 1×5=5

- (i)is the marker enzyme for mitochondria.
- (ii)are involved in the formation of cell plate.
- (iii)is a microbody found in oil-seeds.
- (iv) Proteins to be exported contain special amino acid sequences called.....
- (v) Vital stain.....is used to observe mitochondria in a living cell.

(b) Match the following : ½×8=4

- | | |
|--------------------|---------------------|
| (i) Palade | Cell membrane |
| (ii) Robertson | Cell wall |
| (iii) ER | Lysosomes |
| (iv) Plasmodesmata | Mitochondria |
| (v) De Duve | Unit membrane model |
| (vi) Leucoplast | Cisterna |
| (vii) Aquaporins | Ribosomes |
| (viii) Benda | Plastids |

2. (a) Draw well-labelled diagrams of the ultrastructure of mitochondria and chloroplast. Discuss the semiautonomous nature of the two organelles. 9
- (b) Discuss the structure, location and functions of nucleosomes. 5
3. Differentiate between any *four* of the following pairs :

$3\frac{1}{2} \times 4 = 14$

- (a) Primary cell wall and Secondary cell wall
- (b) Smooth ER and Rough ER
- (c) Euchromatin and Heterochromatin
- (d) Exocytosis and Endocytosis
- (e) Eukaryotic ribosomes and Prokaryotic ribosomes.
4. Write short notes on any *four* of the following : $3\frac{1}{2} \times 4 = 14$
- (a) Role of Golgi body in glycosylation
- (b) Nucleolus and its functions
- (c) Functions of membrane proteins
- (d) Endosymbiont hypothesis
- (e) Lysosomes.