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S. No. of Question Paper : 1534

Unique Paper Code : 216251

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Name of the Paper : Biology-II (LSPT-202)

Name of the Course : B.Sc. Physical Sciences

Semester : II/IV

Duration : 3 Hours

Maximum Marks : 75

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

Attempt any Five questions including

the Question No. 1 which is compulsory.

1. (a) Fill in the blanks :

1×5=5

- (i) The resolution limit for light microscopy is $0.5 \mu\text{m}$. whereas this limit for electron microscopy is
- (ii) The steps for sample preparation for microscopy are
..... and
- (iii) The name "cell" was given by
- (iv) The distinct region in the prokaryotes containing the genetic material is known as
- (v) Thylakoids are present in the cell organelle known as

P.T.O.

(b) Answer the following questions :

1×5=5

- (i) What is a plasmodesmata ?
- (ii) Which cell organelle is also referred to as dictyosome ?
- (iii) How would you define the term 'protoplast' ?
- (iv) What do you understand by the term "leucoplast" ?
- (v) Where would you find cellulose and hemicellulose in a plant cell ?

(c) Write the contribution of the following scientists in the field of biology :

5×1=5

- (i) Matthias Schleiden and Theodor Schwann
- (ii) J.F. Danielli and H. Davson
- (iii) Benda
- (iv) Christian de Duve
- (v) Robert Brown

2. Write short notes on the following (any five) :

5×3=15

- (a) Confocal microscopy
- (b) Cell theory
- (c) Glyoxisomes
- (d) Nuclear pore complex
- (e) Role of cell division
- (f) Nucleolus
- (g) Chloroplast and mitochondrial DNA.

3. Differentiate between the following pairs (any *five*) : 5×3=15
- (a) Peroxisomes and Glyoxisomes
 - (b) Active and passive transport
 - (c) SER and RER
 - (d) Pinocytosis and Phagocytosis
 - (e) Scanning EM and Transmission EM
 - (f) Cell wall and cell membrane
 - (g) Simple and facilitated diffusion.
4. Write notes on the following (any *three*) : 3×5=15
- (a) Fluorescence microscopy
 - (b) X-ray diffraction analysis
 - (c) Formation and functions of lysosomes
 - (d) DNA packaging in eukaryotes
 - (e) Ultrastructure of chloroplast.
5. (a) Explain the structure of eukaryotic cells with the help of well labelled diagram. How are they different from prokaryotic cells ? 3+3+2=8
- (b) What is signal-peptide hypothesis ? Explain with well labelled diagram. 7

6. (a) Write about the structure (with well-labelled diagram) and function of mitochondria. Name two marker enzymes of mitochondria. 3+3+2=8
- (b) What do you understand by semiautonomous nature of cell organelles? Elucidate with regard to chloroplast. 7
7. (a) Give an overview of the cell-cycle. 5
- (b) Explain the various stages of meiosis along with their well labelled diagrams. 10