[This question paper contains 4 printed pages.]

Your Roll No. .....

5192 **B**

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

Paper—LSPT-202

Biology–II–Cell and Cellular Process

(Admissions 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 *Five* questions including Question No. **1** which is compulsory.

1. (*a*) Mention the scientists who coined the name of the following (any *five*) : 5

   (*i*) Nucleus

   (*ii*) Cell

   (*iii*) Chromosome

   (*iv*) Ribosome

   (*v*) Endoplasmic Reticulum

   (*vi*) Mitochondria

   (*vii*) Lysosome

   (*b*) Fill in the blanks (any *five*) : 5

   (*i*) ER provides ..... for the colloidal structure of cytoplasm.

   (*ii*) A simple microscope has a ..... lens.

   (*iii*) Microvilli of intestinal villus contain ..... filament for their mobility.

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(*iv*) Enzymes of respiratory chain and oxidative phosphorylation and carriers are present in ..... .

(*v*) The reticular network which traverse the cytoplasm is known as ..... .

(*vi*) Digestion of cell organelles like old mitochondria by the lysosome is called ..... .

(*c*) True or false (any *five*) : 5

(*i*) Lysosome helps in protein synthesis.

(*ii*) ATP synthesis takes place in ribosome.

(*iii*) Nucleus is the controlling centre of cell.

(*iv*) Nucleus communicates with the cytoplasm through nuclear pores.

(*v*) Cellulose of cell wall is lipid.

(*vi*) Glucose is an important source of energy in biological system.

2. (*a*) Give an account of ultra-structure and functions of mitochondria. 8

(*b*) What do you understand by fluid mosaic theory? Explain the structure of plasma membrane on the basis of the above theory. 7

3. Differentiate between any *five* : 5×3=15

(*i*) Prokaryotic cell and Eukaryotic cell

(*ii*) Autophagy and Heterophagy

(*iii*) Nucleoid and Nucleolus

(*iv*) DNA and RNA

(*v*) Peroxisome and Glyoxysome

(*vi*) Lysosome and Ribosome

(*vii*) Primary cell wall and Secondary cell wall

(*viii*) SEM and TEM.

4. Write short notes on any *five* : 5×3=15

(*i*) Cell cycle and role of cyclins

(*ii*) Packaging of DNA

(*iii*) Synaptonemal Complex

(*iv*) Microtubules

(*v*) Inner-mitochondrial membrane

(*vi*) Mitochondrial DNA

(*vii*) Signal peptide hypothesis

(*viii*) Role of golgibodies in glycosylation.

5. (*a*) Garbage disposals or 'suicidal bags' is the popular expression for one of the cell organelles. Name the organelle and comment on its functions. 8

(*b*) What is heterochromatin? Mention the properties of heterochromatin. Distinguish between constitutive and facultative heterochromatin with examples. 7

6. (*a*) Describe the composition, principle of working and uses of electron microscope. How does it differ from light microscope? Explain. 8

(*b*) Describe the structure of nuclear-pore complex and its role. 7

7. (*a*) What is the role of mitosis in living organism? 5

(*b*) Describe briefly the endosymbiont hypothesis. 5

(*c*) Describe the functions of membrane proteins and membrane lipids. 5

8. (*a*) Describe the changes that occur in the nucleus during meiosis. Add a note on the significance of meiosis. 8

(*b*) Describe the ultrastructure, types and function of ER. 7