

M.Sc. (Part-I) Semester-I (C.B.C.S. Scheme) Examination

BIOTECHNOLOGY

(Cell Biology)

Paper—1BTB1

Time : Three Hours]

[Maximum Marks : 100

Note :— (1) All questions are compulsory and carry equal marks.

(2) Draw well labelled diagrams wherever necessary.

1. Attempt the following :

- (a) Describe endosymbiant theory. 5
- (b) Define magnification and resolving power of a microscope. Discuss the factors which determine the resolving power. 5
- (c) What are the fundamental properties that are shared by all cells ? 5
- (d) Describe Oparin-Haldane hypothesis. 5

OR

- (p) Explain the Urey-Miller experiment and diagram the apparatus. 5
- (q) How does fluorescence microscopy provide an improvement over light microscopy ? What additional information can be obtained by using fluorescence microscopy ? 5
- (r) Describe subcellular fractionation and their identification by density gradient centrifugation. 5
- (s) What are the factors which determine the size of cell. 5

2. Describe the following :

- (a) What are second messengers ? Explain with an example. 5
- (b) Quorum sensing. 5
- (c) Structure and function of Lysosome. 5
- (d) Role of microfilament in motility. 5

OR

- (p) Two-component signaling system in plant. 5
 - (q) Structure and function of Peroxisome. 5
 - (r) Treadmilling in microfilament. 5
 - (s) Role of GTPase switch in cell signalling. 5
3. Name the four classes of ATP-powered pumps that produce active transport of ions and molecules. Indicate which of these classes transport ions only and which transport primary small molecules. 20

OR

At which points in the cell cycle do checkpoint controls operate and how do they prevent progression ? 20

4. Attempt the following :
- (a) How can a proto-oncogene be converted to oncogene ? 5
 - (b) Explain the characteristics of transformed (cancer) cells. 5
 - (c) Describe regulatory steps of glycolysis. 5
 - (d) Explain C3 pathway. 5

OR

- (p) How does a benign tumor differ from the malignant tumor ? 5
 - (q) How can the mutations in apoptosis inducers cause cancer ? 5
 - (r) Explain regulatory steps in TCA. 5
 - (s) Describe the basic structure of the ATP synthase and the mechanism by which it is able to synthesize ATP. 5
5. Explain in detail mode of transmission, characteristics of disease and the present therapies for Hepatitis. 20

OR

Describe in detail embryo sac development and double fertilization in plants. 20