

5. Describe in detail the life cycle of malaria pathogen.

OR

Describe in detail the process of gametogenesis and fertilization in plants. 20



First Semester M. Sc. (Part - I) Biotechnology  
Examination

Paper - I 1 BTB 1

CELL BIOLOGY

P. Pages : 4

Time : Three Hours ]

[ Max. Marks : 100

- Note :** (1) All questions are compulsory and carry equal marks.  
(2) Draw well labelled diagrams wherever necessary.

1. Describe the following :—

- |                                                            |   |
|------------------------------------------------------------|---|
| (a) Basic properties of cell.                              | 5 |
| (b) Stanley Miller's experiment.                           | 5 |
| (c) Principle and applications of fluorescence microscopy. | 5 |
| (d) Cell lysis by physical method.                         | 5 |

OR

- |                                                                             |   |
|-----------------------------------------------------------------------------|---|
| (p) Factors limiting the size of cell.                                      | 5 |
| (q) Role of photosynthesis and aerobic metabolism in unicellular evolution. | 5 |

- (r) Fixation and staining techniques for EM. 5
- (s) Differential centrifugation. 5

2. Explain :—

- (a) Structure and function of peroxisomes. 5
- (b) Give the reason why lysosomal enzymes do not degrade molecules located in the cytosol or nucleus of intact cells. 5
- (c) Basic characteristics of cell signaling pathways. 5
- (d) Two component signaling system. 5

OR

- (p) Components that make up a bacterial cell wall and role of each component in the cell Wall's structure and function. 5
- (q) Phases of actin polymerization *in vitro*. 5
- (r) What are second messengers ? Explain with an example. 5
- (s) Quorum sensing. 5

3. Attempt the following :—

- (a) Describe the relationship between partition coefficient and particle size with regard to membrane permeability. 5

- (b) Structure and role of F-class of pumps. 5
- (c) What is MPF ? Explain its role in Cell's entry into mitosis. 5
- (d) What is ECM ? Describe the components of ECM and their functions. 5

OR

- (p) Why are cotransporters often referred to as examples of secondary active transport ? 5
- (q) Describe features of biological membrane and list its important function. 5
- (r) What is APC ? Explain its role in cell cycle regulation. 5
- (s) Regulation of hematopoiesis. 5

4. What is Cancer ? Give the properties of cancerous cell and describe the role of Gain-of-function and loss-of-function mutation in cancer.

OR

Photosynthesis can be divided into multiple stages. What are the stages of Photosynthesis and where does each occur within the chloroplast ? 20