

**B.Sc. BIOTECHNOLOGY**  
**First Semester**  
**CELL BIOLOGY**  
**(BBT- 103)**

**Duration: 3Hrs.**

**Full Marks: 70**

Part-A (Objective) =20  
Part-B (Descriptive) =50

**(PART-B: Descriptive)**

**Duration: 2 hrs. 40 mins.**

**Marks: 50**

**Answer any four from Question no. 2 to 8**  
**Question no. 1 is compulsory.**

1. How are proteins synthesized in the ER? Why is glycosylation of proteins required? (6+4=10)
2. Briefly explain the different complexes of chloroplast. Describe the structure of ATP synthetase. (5+5=10)
3. What is cytoskeleton? What are Microtubule Associated Proteins? Explain assembly and disassembly of microtubules. (2+3+5=10)
4. What is extracellular matrix? What does animal and plant ECM include? What are major roles of ECM? (3+3+4=10)
5. What do you mean by active transport? Describe with the help of cation exchange pump. (2+8=10)
6. Describe the nuclear membrane and nuclear pore structure with the help of proper diagram. (10)
7. What is mitosis? Describe the process in detail in animals. (2+8=10)
8. What do you mean by apoptosis? Explain necrosis. Write the differences between apoptosis and necrosis. (3+2+5=10)

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**B.Sc. BIOTECHNOLOGY**  
**First Semester**  
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**Duration: 20 minutes**

**Marks – 20**

**(PART A - Objective Type)**

**I. Choose the correct answer:**

**1×15=15**

- ATP is produced by  
(a) Mitochondria (b) Chloroplast  
(c) By both organelles (d) By none of the organelles
- Chaperones help in attaining \_\_\_\_\_ structure.  
(a) Two dimensional (b) Three dimensional  
(c) Tertiary (d) Quaternary
- The site of light reaction is  
(a) Grana (b) Outer membrane  
(c) Stroma (d) Thylakoid membrane
- Lysosomal enzymes are  
(a) Oxidative (b) Proteolytic  
(c) Hydrolytic (d) Reducing
- Microtubule is composed of  
(a)  $\alpha$  and  $\beta$  units (b)  $\mu$  and  $\epsilon$  units  
(c)  $\beta$  and  $\epsilon$  units (d)  $\alpha$  and  $\epsilon$  units
- The main difference between animal and plant cell  
(a) Animal cell lack rigid cell wall (b) Animal cells have vacuoles  
(c) Plant cell lack rigid cell wall (d) Plant cell have small vacuoles
- The ECM is composed of an interlocking mesh of  
(a) fibrous proteins and glycosaminoglycans (GAGs)  
(b) globular proteins and glycosaminoglycans (GAGs)  
(c) tubulin  
(d) Both a and b
- During glycosylation of proteins the carbohydrate residues attached are  
(a) 2 NAG, 9 Mannose and 3 Glucose  
(b) 1 NAG, 9 Mannose and 4 Glucose  
(c) 2 NAG, 10 Mannose and 2 Glucose  
(d) 1 NAG, 10 Mannose and 3 Glucose



9. Photosystem II is composed of \_\_\_\_\_ reaction centre.  
 (a) P680 (b) P700 (c) P720 (d) P660
10. Which is NOT true about the cell theory?  
 (a) Its various parts were described by Schleiden, Schwann.  
 (b) It states that all organisms are composed of cells.  
 (c) It states that all cells come from pre-existing cells.  
 (d) It states that bacteria and other small organisms can arise spontaneously.
11. Lymphoma is cancer of  
 (a) lymph cell (b) cardiac muscle  
 (c) hepatic cell (d) oral mucous membrane
12. Sarcomas occur in the  
 (a) ectoderm tissue (b) endoderm tissue  
 (c) mesoderm tissue (d) hypoxic cells
13. XRCC1 is  
 (a) protease (b) DNA repair protein  
 (c) lipid associating protein (d) tumour protein
14. p53 is  
 (a) lipase enzyme (b) amylase enzyme  
 (c) oncozyne (d) tumour suppressor gene
15. Total lysis of cells observed in  
 (a) apoptosis (b) hydrolysis  
 (c) necrosis (d) radiation

**II. Match the following:**

**1×5=5**

- |                                       |                        |
|---------------------------------------|------------------------|
| i) mitosis                            | a) osmosis             |
| ii) Sandwich model of plasma membrane | b) nuclear pore        |
| iii) nuclear membrane                 | c) somatic cell        |
| iv) hypertonic solution               | d) active transport    |
| v) sodium potassium pump              | e) Danielli and Davson |

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