

**Nayagarh Autonomous College, Nayagarh**

**Semester-1, CC- 2: Biomolecules and cell biology**

**Unit-1**

**1.Fill in the blanks (1×8)**

- 1.In double helix of DNA,the two DNA strands are\_\_\_\_\_.
- 2.RNA does not possesses \_\_\_\_\_ base.
- 3.Mineral associated with Cytochrome is\_\_\_\_\_.
- 4.The basic unit of Nucleic acid is\_\_\_\_\_.
- 5.Antibodies with enzymes\_\_\_\_\_.
- 6.\_\_\_\_ is the most abundant molecules in earth.
- 7.Lock and key enzyme hypothesis postulated by\_\_\_\_\_.
8. Cellulose is the example of\_\_\_\_\_.

**2.Answer the questions in 2-3 sentences (1.5×8)**

- 1.Carbohydrates 2. Bioenergetics 3.Biocatalyst.
4. Michaelis- Menten equation 5. Properties of water
- 6.First law of Thermodynamics 7. Coupled reaction
- 8.Ionic bonds 9. Free energy 10. Buffer

**3. Answer the questions within 75 words (2×8)**

- 1.Entropy 2. Exergonic reaction 3. ATP cycle
4. Co-factors 5. Coupled reaction 6. Induced fit hypothesis
7. Significance of buffer 8. Disulphide bond
9. Ionic bond 10.Lock and key hypothesis

**4. Answer the questions within 500 words (6×4)**

- 1.Write down structure and properties of water?

2. Explain the composition of buffer solution and how they maintain a steady pH?
3. Discuss the laws of thermodynamics and write its relevance to biological systems?
4. Give an account of concept of free energy?
5. Describe Coupled and redox reaction?
6. Describe the different types of covalent bonds?
7. Write down mechanism of Enzyme action?
8. What are enzymes? Give an account of nomenclature and classification of enzymes?

## **Unit-2**

### **Group-A**

#### **1. Answer the following questions: (1x 8 =8)**

- i) The two strands of DNA are held together by -----.
- ii) In nucleoside, nitrogen base is attached to pentose sugar by a ----- bond.
- iii) The wax found in human blood is -----.
- iv) In protein amino acids are linked by----- bond.
- v) Which purine bases are found in RNA?
- vi) What are the most diverse molecules in the cell?
- vii) Lipids are insoluble in water because lipid molecules are -----.
- viii) Which is the simplest amino acid?

### **Group-B**

#### **2. Answer the following questions: (1.5x 8 =12)**

- i) What is peptide linkage?
- ii) What is primary structure of Protein?

- iii) Draw the structure of mature t-RNA.
- iv) What is nucleoside?
- v) What is nucleotide?
- vi) What are essential amino acids and why are they called so?
- vii) What are the forces that stabilize the structure of nucleic acids?
- viii) Why lipids are called amphipathic?

### **Group-C**

#### **3. Answer the following questions: (2x 8 =16)**

- i) What is the difference between saturated and unsaturated fatty acids?
- ii) What are phospholipids?
- iii) What is  $\alpha$ -helix?
- iv) What is m-RNA?
- v) What is Z-DNA?
- vi) What is a zwitterions?
- vii) What is  $\beta$ -pleated sheet?
- viii) What is the difference between globular and fibrous proteins?

### **Group-D**

#### **4. Answer the following questions: (6x4= 24)**

- i) Describe the various levels of protein structures?
- ii) Describe t-RNA molecules and its function?
- iii) Write the main structural and functional difference between DNA and RNA?
- iv) Explain the classification of amino acids based on its side chains?

### **Unit-3**

#### **Q1.FILL IN THE BLANKS (1x8=08)**

- (i) The space between two mature cell is called \_\_\_\_\_.
- (ii) The major constituent of middle lamella is \_\_\_\_\_.
- (iii) Secondary wall grows by the process of \_\_\_\_\_.
- (iv) \_\_\_\_\_ proposed cell theory?
- (v) \_\_\_\_\_ is differentially permeable ?
- (vi) Protoplasm is actually a \_\_\_\_\_.
- (vii) Between a prokaryote and eukaryote \_\_\_\_\_ cell has a shorter cell division time.
- (viii) The thickness of plasmamembrane is \_\_\_\_\_.

**Q2. Answer within "two" Sentences (1.5×8=12)**

- (i) Define Prokaryotic cell with suitable example?
- (ii) What is the chemical composition of cell membrane ?
- (iii) What is Linker DNA?
- (iv) What is chromosome
- (v) Write two features of cell theory?
- (vi) What is mesosome?
- (vii) Define plasmodesmata?
- (viii) Which theory is an evolutionary theory that explains the origin of eukaryotic theory from prokaryotes ?

**Q3. Answer Within 75 Words (2×8=16)**

- (i) Explain Endo symbiotic theory ?
- (ii) Write notes on Middle Lamella?
- (iii) Explain functions of cellwall?
- (iv) What is microfibrils?
- (v) Explain Unit Membrane Model?

(vi) What is active Transport?

(vii) Write notes on chromatin?

viii) Give an account on Vesicle budding?

**Q4. Answer within 500 words (4×6=24)**

(i) Describe structure, chemical composition and function of cell wall?

(ii) Explain origin of eukaryotic cell (Endosymbiotic theory)?

(iii) Give an account on membrane Transport?

(iv) Explain molecular organization of chromatin?

#### **Unit-4**

**(1) Fill in the blanks with one word (1×8)**

(i) \_\_\_\_\_ are known as power houses of the cell.

(ii) Microfilaments are composed of a protein called \_\_\_\_\_.

(iii) Due to Hydrolytic activity, Lysosomes are known as \_\_\_\_\_.

(iv) Glyoxylate metabolism is known to occur in \_\_\_\_\_.

(v) Ribosomes attached throughout surface of ER is known as \_\_\_\_\_.

(vi) Grana are densely packed stacks of membrane layers called \_\_\_\_\_.

(vii) Chiasma formation occurs during \_\_\_\_\_.

(viii) In animal cells cytokinesis is brought about by \_\_\_\_\_ method.

**(2) Short answer type: Answer the questions in 2-3 sentences (1.5×8)**

(i) Write notes on Crossing-Over?

(ii) Describe types of Endoplasmic reticulum?

(iii) Give the details of distribution of lysosome?

(iv) What are functions of microtubules?

(v) What is endosymbiotic theory?

**(Vi) What is metaphasic plate?**

**(Vii) Why meiosis is called reductional division?**

**(Viii) What are bivalents?**

**(3) Short answer type : Answer the questions within 75 words(2×8)**

**(i) what is cytokinesis?**

**(ii) Write difference between Zygotene and Pachytene?**

**(iii) Name the phases of cell cycle?**

**(iv) Comment a note on Mitochondria are “ Power house of the cell”?**

**(V)Comment on Chloroplast is semi-autonomus structure?**

**(Vi) Comment on “Lysosomes are suicidal bags.”**

**(Vii) Describe smooth ER and it's function?**

**(Viii) write notes on reductional division.**

**(4) Long answer type: Answer the questions within 500 words(6×4)**

**(i) Narrate the different stages of meiosis-1?**

**(ii) What is cell cycle? Describe eukaryotic cell cycle and How the cell cycle is regulated?**

**(iii) What is mitosis? Describe the different stages of mitosis?**

**(iv) Narrate the structure and function of mitochondria?**

**(V) Discuss on the Semi- autonomous nature of Chloroplast and give an account of structure and functions of Chloroplast?**

**(Vi) Describe the structure and functions of cytoskeleton?**