**APPLIED BIOLOGICAL SCIENCE – CAT**

**Time: 1 Hour | Marks: 30**

**Instructions:**

* Answer all questions.
* Be precise and concise.
* Use examples where applicable.

**SECTION A: MULTIPLE CHOICE QUESTIONS (5 Marks)**

*Choose the most appropriate answer. Each question is worth 1 mark.*

1. Which of the following best describes a **prokaryotic cell**?  
   A. Has membrane-bound organelles  
   B. Lacks a nucleus  
   C. Is always multicellular  
   D. Has a well-developed Golgi body
2. The primary function of **ribosomes** in a cell is:  
   A. Energy production  
   B. Protein synthesis  
   C. DNA replication  
   D. Waste removal
3. Which macromolecule contains genetic information?  
   A. Lipids  
   B. Proteins  
   C. Nucleic acids  
   D. Carbohydrates
4. A key difference between **plant and animal cells** is:  
   A. Animal cells have chloroplasts  
   B. Plant cells have no cell membrane  
   C. Plant cells have a cell wall  
   D. Animal cells have a large central vacuole
5. Which of the following is **not** a function of enzymes?  
   A. Speed up chemical reactions  
   B. Act as biological catalysts  
   C. Are used up during reactions  
   D. Lower activation energy

**SECTION B: SHORT ANSWER QUESTIONS (10 Marks)**

*Answer all questions. Each carry 2 marks.*

1. List **two differences** between eukaryotic and prokaryotic cells.
2. Explain the role of the **mitochondria** in a cell.
3. State **two functions of proteins** in living organisms.
4. Define **osmosis** and give one example of where it occurs in the human body.
5. Mention **two types of carbohydrates** and give an example of each.

**SECTION C: STRUCTURED/ESSAY QUESTIONS (15 Marks)**

*Answer all questions. Provide detailed explanations where necessary.*

1. **(5 marks)**  
   a) Describe any **three functions of the cell membrane**. *(3 marks)*  
   b) Differentiate between **diffusion** and **active transport**. *(2 marks)*
2. **(5 marks)**  
   a) Discuss the **structure and function of DNA**. *(3 marks)*  
   b) What is the significance of DNA replication? *(2 marks)*
3. **(5 marks)**  
   a) Explain **three factors that affect enzyme activity**. *(3 marks)*  
   b) Describe the concept of **enzyme specificity**. *(2 marks)*