

Mid-West University  
**Examinations Management Office**  
End Semester Examinations 2081

Bachelor level/ B. Sc / 5<sup>th</sup> Semester  
Time: 3 hours  
Subject: Bio-physics (ELC455)

Full Marks: 60  
Pass Marks: 30

*Candidates are required to give their answer in their own words as far as Practicable. The figures in the margin indicate full marks.*

**Group –A**

**Long answer questions (Attempt all)**

[4x6 = 24]

1. Define Biomolecules. What is the General Molecular Structure of an Amino Acid?
2. Derive the diffusion equation in one dimension and the Brownian equation of motion.
3. What is the nerve impulse? Describe the Action potentials and Ion channels to related nerve impulses.
4. Define protein-ligand. What is the method for the computational techniques for protein-ligand binding site prediction?

**OR**

Describe the Origin and Evolution of Life.

**Group - B**

**Short answer questions (Attempt all)**

[6x4 = 24]

5. What is Diffusion? Describe the types of diffusion in cell membranes.
6. Describe the ionic currents through electrolytes, Electron conduction, and tunneling.
7. Describe the types of carbohydrates and their applications.
8. Explain how the Ionizing and Non-ionizing radiation, Interaction of Ionizing radiation affects living beings.

**OR**

Describe the manipulation of biomolecules using optical tweezers, and tomography.

9. What is Molecular Docking? Explain the Computational study of drug molecules, the Computational Design of Drugs, and their Functional Properties.
10. X-ray diffraction (XRD) is an analytical technique based on the diffraction of X-rays by matter, especially for crystalline materials. How can you explain this statement?

**Group - C**

**Very Short answer question (Any Six)**

[6x2 = 12]

11. What is the difference between Prokaryotic and Eukaryotic cells?
12. List the unique features of plant cells.
13. What are the components of the plasma membrane?
14. What is the negative electrode called in electrolysis?
15. What are dosimetry and dosimeters? Describe its types.
16. What is meant by the scattering of light? Explain Rayleigh Scattering.
17. What are the differences between the Neutron and X-ray scattering of crystal diffraction?
18. What are the health effects of radiation exposure?

**The End**