



Roll No: 

--	--	--	--	--	--	--	--	--	--

## The Assam Royal Global University, Guwahati

Royal School of Biosciences

B. Sc (Hons.) Biochemistry, 2nd semester

Semester End Examination, June 2023

Course Title: Membrane Biology and Biocnergetics

Course Code: BCH152C202

Time: 3 Hours

Maximum Marks: 70

**Note: Attempt all questions as per the instructions given.**

*The figures in the right-hand margin indicate marks.*

### Section – A

1. Attempt **all** questions. (Maximum word limit 50) 2 x 8
- What are amphiphilic molecules? Give examples.
  - Give one example of a phospholipid and sphingolipid with structure.
  - What is the difference between active and passive transport?
  - Define group translocation. Give examples
  - Draw and indicate the high energy bonds in an ATP molecule.
  - What is a redox reaction? Give example.
  - Define Thylakoids. Why is it important for plant cells?
  - What is photorespiration? Name the enzyme that catalyzes photorespiration.

### Section – B

2. Attempt **any two** of the following: 6 x 2
- Classify the membrane lipids with appropriate examples and structures.
  - Demonstrate the dynamic nature of membranes with FRAP.
  - Discuss different types of lipid aggregates formed in an aqueous solution. Which factors can influence the formation of those structures?
3. Attempt **any two** of the following: 7 x 2
- How vesicular transport occurs between different organelles? What are the different types of vesicular transport?
  - Classify different types of active transport with proper illustrations and examples.
  - With a neat diagram explain the mechanism of Na<sup>+</sup>/K<sup>+</sup> transport across the membrane.
4. Attempt **any two** of the following: 7 x 2
- How the First Law of Thermodynamics is applicable in Biological Systems? Deduce the relationship between the standard free energy change and equilibrium constant.
  - Explain the roles of complex I and II in the electron transport chain.
  - Compare oxidative phosphorylation with the substrate-level phosphorylation? Elaborate on the role of FoF1 synthetase in the mitochondrial electron transport chain.
5. Attempt **any one** of the following: 14 x 1
- Outline in detail the flow of electrons between the photosystems in the chloroplast. Elaborate on the significance of Cytochrome b6f Complex in photosynthesis.
  - Describe the Dark phase reactions of photosynthesis. Write a short note on photorespiration.