

The Assam Royal Global University, Guwahati

Royal School of Biosciences
B.Sc. Biochemistry 2nd Semester
Semester End Examination, July 2022
Course Title: Membrane Biology & Bioenergetics
Course Code: BCH152C203

Time: 3 Hours

Maximum Marks: 70

Note: Attempt all questions as per 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 is critical micelle concentration?
 - What is a critical packaging parameter?
 - What is active transport?
 - What is the function of the acetylcholine receptor?
 - What is meant by bioenergetics?
 - Define enthalpy.
 - What is Hill reagent?
 - What are the two processes of photosynthesis?

Section – B

2. Attempt **any two** of the following questions: 6 x 2
- Who proposed the lipid bilayer concept? What are the properties of a lipid bilayer?
 - “Lipids and proteins are unevenly distributed in the membrane”, justify.
 - What is a liquid disordered state? Discuss the factors affecting the states of a bilayer?
3. Attempt **any two** of the following questions: 7 x 2
- Explain various transport mechanisms of solutes across the membrane?
 - What is P-type ATPase? Diagrammatically explain the mechanism of Na⁺K⁺ ATPase?
 - Discuss about aquaporins and their functions in different cells.
4. Attempt **any two** of the following questions: 7 x 2
- Discuss thermodynamic quantities that describe energy changes in chemical reactions.
 - How does an exergonic reaction help thermodynamically unfavorable reaction to occur?
 - Discuss the mechanism of ATP hydrolysis in a biochemical reaction.
5. Attempt **any two** of the following questions: 7 x 2
- Prove that light drives electron flow from H₂O to an acceptor in the chloroplast.
 - What is a light-harvesting complex? Explain the structure of chloroplast and chlorophyll.
 - Differentiate between cyclic and noncyclic electron flow. Discuss the effects of herbicides on photosynthesis.