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The Assam Royal Global University, Guwahati

Royal School of Biosciences
M.Sc Biochemistry, 4th semester
Semester End Examination, June 2023
Course Title: Membrane Biology
Course Code :BCH154C402

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**

a. What are hydrophobic and hydrophilic molecules? Give examples.
b. What is meant by a bilayer membrane?
c. Give two examples of phospholipids with structure.
d. Compare CPP with CMC.
e. Hydrophobic molecules cannot penetrate the membrane-explain.
f. What is the transition temperature of a membrane?
g. What is the difference between primary and secondary active transport?
h. Define the ABC family of transporters. Give example.

Section – B

2. Attempt **any one**of the following: **12x 1**

a. a.With proper illustration and examples, classify the different types of membrane proteins and lipids.
b. b.Describe the different components of the plasma membrane of a eukaryotic cell, with a suitable diagram and labeling ,what are the biological significances of the plasma membrane?

3. Attempt **any two** of the following: **7 x 2**

a. Discuss different types of polymorphic structures formed by phospholipids in an aqueous solution. Which factors can influence the formation of those structures?
b. What are noncovalent interactions? How do the noncovalent interactions play important roles in stabilizing the bilayer structure of the membrane? Discuss in detail.
c. How lipid rafts are formed? Describe the components of an erythrocyte membrane.

4. Attempt **any two** of the following: **7 x 2**

a. With a suitable diagram elaborate on the role of Flippase, Floppase, and Scramblase in phospholipid transport.
b. Elaborate with a suitable diagram, the application of TNBS labeling in the determination of membrane fluidity.
c. Explain the phase transition of biological membranes. Describe the factors that can influence the phase transition of the membrane.

5. Attempt **any two** of the following: **7 x 2**

a. Compare active and passive transport with a suitable diagram. Classify different types of passive transport.
b. With a suitable diagram, elaborate on the mechanism of Na+/K+ ATPase across the membrane.
c. Define and classify voltage-gated ion channels with proper examples. How do they differ from ion transporters?