

**2014**

**M.Sc.**

**1st Semester Examination**

**BIOCHEMISTRY**

**PAPER—BIC-103**

*Full Marks : 40*

*Time : 2 Hours*

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

*Candidates are required to give their answers in their own words as far as practicable.*

**Group—A**

**1. Answer any five questions :**

**5×2**

(a) What is lipid raft ?

(b) What is cardiac output ?

(c) What is EPSP and IPSP ?

(d) What are the differences between prokaryotic and eukaryotic ribosome ?

*(Turn Over)*

- (e) Mention the function of different components of troponin molecules.
- (f) Write the importance of liposomes.
- (g) Mention the different types of membrane receptors for signal transduction.
- (h) Write the different components of nephron with suitable diagram.

**Group—B**

Answer any two questions : 5×2

2. Briefly describe the muscular contraction and relaxation mechanism and the formation of actomyosin complex with suitable diagram. 5
3. (a) Describe the structure of nucleosome.  
(b) Write briefly on the role played by nucleosome in cell. 3+2
4. (a) Mention in detail about the differences in peroxisome and lysosomal functions.  
(b) Why bacteria are very sensitive to oxidative threats? 4+1

5. (a) What are polyhydric alcohols ?  
 (b) Discuss in brief the role played by a polyhydric alcohol in cellular physiology. 1+4

**Group—C**

Answer any *two* questions : 10×2

6. (a) What do you understand by membrane fluidity ?  
 (b) Mention the factors affecting membrane fluidity including the importance of maintaining it.  
 (c) What are cerebrosides ? State their importance in membrane. 2+(3+2)+(2+1)
7. (a) What is bile ? How is it formed ?  
 (b) Discuss the importance of bile in physiological system.  
 (c) What is Jaundice ? 2+3+4+1
8. (a) What is Bowman's capsule ? What is its importance ?  
 (b) Discuss the role of kidney in acid-base regulation. (2+3)+5

9. (a) Draw a representative reaction curve for exothermic reaction and (i) label the activation energy for the forward and reverse reaction ; (ii) Enthalpy for the forward and the reverse reaction. How will the curve change with the addition of Catalyst ?
- (b) The activation energy of a non-catalyzed reaction at 37°C is 200 Kcal.mol<sup>-1</sup> and the activation energy for the same reaction when catalyzed by an enzyme is 6 kCal mol<sup>-1</sup>. Calculate the ratio of the rate constants of the catalyzed and the non-catalyzed reactions. Assume frequency factors to be the same in both cases. [R = 1.987 cal] 6+
10. (a) What do you mean by buffer solution ? Explain how the pH of a buffer solution does not change on the addition of a drop of the strong acid or base ?
- (b) Write the relation between H<sup>+</sup> ion concentration and K<sub>b</sub> value (K<sub>b</sub> → dissociation constant of base) of a solution.
- (c) Discuss the role of promoters and inhibitors (with examples) in the catalysts.
- (d) Explain with example the relation between pH and pK<sub>a</sub> values of an acid. 5+2+2+