

2013

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.

Answer all questions.

Group—A

1. Answer any five from the following : 5×2

- (a) Explain the movement of protein molecules during electrophoresis at
 - (i) pH 5 &
 - (ii) pH 10.
- (b) Name some biomolecules which are acidic in nature
- (c) Write the differences between order and molecularity of a reaction.

(Turn Over)

- (d) What is geometrical isomerism ?
- (e) What are the functional differences between endoplasmic reticulum and golgi complex ?
- (f) What is $\text{Na}^+ - \text{K}^+$ ATPase System ? What is its main function ?
- (g) Name two unsaturated fatty acids.
- (h) Mention two important enzymes present in mitochondrial membrane ? Mention their functions also.

Group—B

Answer any *two* from the following : 5×2

- 2. (a) Vinyl ether is better anesthetic agent than diethyl ether and chloroform—justify the statement.
- (b) How would you prepare t-Butyl methyl ether in the laboratory ?

3+2

- 3. Describe the different steps of carbohydrate and protein digestion in the gastrointestinal tract.

$2\frac{1}{2}+2\frac{1}{2}$

- 4. Write down the different equation to show the relation between :

- (i) 1st order rate constant and reaction concentration.

- (ii) 1st order rate constant and temperature of the reaction.
- (iii) Draw a graph to show the change of reactant and product concentrations with time.

$$1\frac{1}{2} + 1\frac{1}{2} + 2$$

5. Give one or two important features for each fatigue, tetanus and rigor-mortis.

5

Group—C

Answer any *two* from the following : 10×2

6. (a) What do you mean by physiological buffer system? Mention the conditions to maintain maximum buffer capacity of a buffer solution. Mention the different types of buffer systems present in the cells and extracellular fluids to maintain a constant pH in the living body.

2+1+4

- (b) A chemist needs a buffered solution of propionic acid and its salt $\text{CH}_3\text{CH}_2\text{CO}_2\text{Na}$. Calculate the ratio of [Acid/Salt] required to yield a pH 4.3 [Given K_a for propionic acid is 1.3×10^{-5}].

3

7. (a) What is meant by chemical kinetics? How is it related with biological system? Write the factors which affect the rate of an enzymatic reaction.

2+1+4

- (b) Calculate the activation energy of a reaction whose rate constant is tripled by a rise of temp. for 22°C to 32°C.

3

8. (a) Mention the different components of bipolar limb lead and describe normal ECG graph with suitable picture.
- (b) Describe in detail the lysosomal function and the degradation pathway controlled by this organelle.

7+3

9. (a) Give a brief diagram of a nerve structure and describe all phases of electrical phenomenon including ionic events during its impulse transmission.
- (b) How do the structural deformities initiate neurodegenerative diseases?

7+3
