

91551

B.Sc. 2nd Semester New Scheme Examination,

May-2017

BIO-TECHNOLOGY

Paper-BT-205

Physical Chemistry

Time allowed : 3 hours]

[Maximum marks : 40

Note : Attempt five questions in all, selecting two questions from each section. All questions carry equal marks.

Section-I

1. (a) Why rate constant is independent of units of concentration ? 2
- (b) Derive Integrated rate equation for second order reaction. 4
- (c) Name various methods used for determination of order of reaction. 2
2. (a) Give a brief account of graphical method for determining the order of reaction. 2
- (b) Derive Integrated rate equation for third order reaction. 4
- (c) What is the order of reaction if the value of rate constant is 6935^{-1} ? 2

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[P.T.O.]

3. (a) Explain :
- (i) Temperature coefficient
 - (ii) Activation energy. 4
- (b) Describe "Transition state theory". What are the advantages of this theory over collision theory ? 4
4. (a) Write the characteristics of third order reaction. 2
- (b) Write Arrhenius equation giving the effect of temperature on the rate constant of a reaction. 3
- (c) After 24 hours, only 0.125 g out of the initial quantity of 1 g of radio isotope remains behind. What is its half-life period ? 3

Section-II

5. (a) Explain the effect of dilution on :-
- (i) Specific conductance. 4
 - (ii) Equivalent conductance.
- (b) What is the formulae of solubility product (K_{sp}) for :-
- (i) $AgCl$

- (ii) Ag_2CrO_4 2
- (c) What is the unit for
- (i) Molar conductance
- (ii) Kappa (κ) 2
6. (a) What is the formula of Handerson-Hazel equation for :-
- (i) Basic Buffer
- (ii) Acidic Buffer 4
- (b) Explain Kohlrausch's law of independent migration of ions in terms of molar conductivity as well as in terms of equivalent conductivity? 4
7. (a) Explain the Ostwald's dilution law and also give its importance. 4
- (b) The equivalent conductance of 0.1 N solution of acetic acid is $5.32 \text{ S cm}^2 \text{ eq}^{-1}$ at 298 K. The ionic conductance of H^+ and CH_3COO^- ions are 349.8 and $40.9 \text{ S cm}^2 \text{ eq}^{-1}$ resp. Calculate dissociation constant of acetic acid at 298 K. 4

8. (a) Write all the postulates of Arrhenius theory of ionization. 3
- (b) Explain Hittorf's method for the determination of transport number. 3
- (c) Calculate the pH of 10^{-8} M NaOH solution. 2