

Roll No.

21202

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B. Sc. (Pass Course) 2nd Semester
Examination – May, 2019

CHEMISTRY - II (PHYSICAL CHEMISTRY)

Paper : CII-202

Time : Three hours] [Maximum Marks : 29

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all including Question No. 1 which is compulsory. Select one question from each Section. All questions carry equal marks.

- 1. (a) What is the half life period of a zero order reaction ? 1 × 5 = 5
- (b) Describe the effect of temperature on rate of reaction graphically.
- (c) Give the significance of Nernst equation.
- (d) Differentiate between molecularity and order of a chemical reaction.
- (c) Explain Buffer mechanism of Buffer action.

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UNIT – I

- 2. (a) What is rate equation ? Derive the integrated rate law expression for 2nd order reaction. 3
- (b) A first order reaction is 40% complete in 50 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete ? 3
- 3. (a) What is the order of a reaction ? Explain the methods for determining order of a reaction. 4
- (b) Show graphically the variation of half life for a 1st order reaction with concentration. 2

UNIT – II

- 4. (a) The temperature coefficient of the rate of reaction is 2.3. How many times will the rate of reaction increase if the temperature is raised by 25 K. 4
- (b) What is frequency factor ? Give its significance. 2
- 5. Explain in detail the evaluation of rate constant using Collision theory of bimolecular chemical reaction. 6

UNIT – III

- 6. (a) What is specific conductance and equivalent conductance ? Discuss their variation with concentration. 4
- (b) Calculate the degree of dissociation of 0.01 M solution of formic acid. $K_a = 2.1 \times 10^{-4}$ at 298 K. 2

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7. (a) What is transport number ? What are factors affecting it ?
- (b) Explain Hittorf's method for the determination of transport number.

UNIT - IV

8. (a) State Kohlrausch's Law of independent migration of ions. The molar conductivities at infinite dilution of sodium chloride, hydrochloric acid and sodium acetate are 126.4, 426.1 and 91.0 $\text{cm}^2 \text{mol}^{-1}$ respectively at 25°C.

Calculate the molar conductivity at infinite dilution for acetic acid.

- (b) Define pH.
9. (a) What are the various applications of conductance measurements?
- (b) Derive Henderson - Hasselbalch equation.