

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
BSc DEGREE EXAMINATION MAY 2019  
(Sixth Semester)

Branch- CHEMISTRY

**PHYSICAL CHEMISTRY-II**

Time : Three Hours

Maximum : 75 Marks

**SECTION-A (20 Marks)**

Answer ALL questions

ALL questions carry EQUAL marks (10 x 2 = 20)

- 1 Define the term rate constant.
- 2 Write the unit of zero-order and second-order reactions.
- 3 What are parallel reactions?
- 4 Give any two characteristics of chain reactions.
- 5 What is activation energy?
- 6 State Stark - Einstein's law of photochemical equivalence.
- 7 Define dipole moment.
- 8 Write the Debye equation and explain the terms in it.
- 9 State eutectic system.
- 10 What is congruent melting point?

**SECTION - B (25 Marks)**

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a Explain the factors influencing the rate of a reaction.  
OR  
b Distinguish between order and molecularity of a reaction.
- 12 a What are potentiometric titrations? Discuss the potentiometric titration of  $\text{FeSO}_4$  against  $\text{KMnO}_4$ .  
OR  
b Write notes on : (i) Consecutive reactions (ii) Reversible reactions.
- 13 a Discuss about the collision theory of biomolecular reactions.  
OR  
b Write a note on phosphorescence.
- 14 a How will you measure magnetic susceptibility by Guoy's method?  
OR  
b Distinguish between diamagnetism and paramagnetism.
- 15 a Derive Gibb's phase rule.  
OR  
b Draw and explain the phase diagram of  $\text{CO}_2$  system.

**SECTION - C (30 Marks)**

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

- 16 Derive an expression for the first-order rate constant. Write its characteristics.
- 17 Discuss the following methods of determining the order of a reaction :  
(i) Differential method (ii) Half-life method (iii) Ostwald's isolation method
- 18 Discuss the kinetics of photochemical formation of HBr.
- 19 Describe the applications of magnetic susceptibility.