

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION MAY 2026
(Fifth Semester)**

Branch – **CHEMISTRY**

PHYSICAL CHEMISTRY-I

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which electrolyte shows a sharp increase in molar conductance on dilution? a) KCl b) NaOH c) CH ₃ COOH d) HCl	K1	CO1
	2	The correct relation is: a) $\kappa = \Lambda_m \times C$ b) $\Lambda_m = \kappa / C$ c) $\Lambda_m = \kappa \times 1000 / C$ d) $\kappa = \Lambda_m \times 1000 / C$	K2	CO1
2	3	The electrophoretic effect refers to: a) Migration of ions with solvent b) Retardation of ionic mobility due to opposite ion cloud c) Increased conductance due to ion-pairing d) None of these	K1	CO1
	4	The graph of Λ_m vs $\sqrt{C}$ for weak electrolytes is: a) Straight line extrapolated to Λ_m° b) Hyperbolic curve c) Constant value d) Inverse curve	K2	CO1
3	5	According to Brønsted–Lowry concept, an acid is: a) Proton donor b) Proton acceptor c) Electron pair acceptor d) Electron pair donor	K1	CO2
	6	Buffer capacity is maximum when: a) [acid] >> [salt] b) [salt] >> [acid] c) [acid] = [salt] d) Buffer concentration is very low	K2	CO2
4	7	The liquid junction potential arises due to: a) Electrode dissolution b) Different ionic mobilities across the junction c) Polarization d) Hydrogen overvoltage	K1	CO2
	8	The relationship between EMF and entropy change is: a) $\Delta S = -nFE/T$ b) $\Delta S = nFE/T$ c) $\Delta S = -\Delta H/T$ d) $\Delta S = \Delta G/T$	K2	CO2
5	9	Electroplating is based on: a) Faraday's law b) Ohm's law c) Nernst equation d) Galvanic cell principle	K1	CO3
	10	In corrosion, when the metal surface itself acts as anode and cathode, it is called: a) Galvanic corrosion b) Pitting corrosion c) Uniform corrosion d) Stress corrosion	K2	CO3

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

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Module No.	Question No.	Question	K Level	CO
1	11.a.	Describe Faraday's laws of electrolysis with examples.	K3	CO1
	(OR)			
	11.b.	Explain the variation of conductance with concentration for strong and weak electrolytes with neat graph.		
2	12.a.	Deduce the main postulates of Arrhenius theory of ionization.	K3	CO1
	(OR)			
	12.b.	Explain the following a) Debye-Falkenhagen effect b) Wein effect		
3	13.a.	Discuss the relative strength of acids and bases with respect to their structure.	K4	CO2
	(OR)			
	13.b.	Write short notes on: a) Ionic product of water b) Common ion effect		
4	14.a.	Describe the construction and working of Calomel electrode.	K4	CO2
	(OR)			
	14.b.	Give an account of Electrochemical series and its applications.		
5	15.a.	Write notes on electroplating units and their basic components.	K5	CO3
	(OR)			
	15.b.	Define corrosion. Explain different types of corrosion with examples.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Discuss in detail the determination of transport number by Hittorf's method.	K4	CO1
2	17	State and Explain Ostwald's dilution law.	K5	CO1
3	18	Derive the Henderson-Hasselbalch equation for buffer solutions.	K4	CO2
4	19	Elaborate the applications of EMF measurements.	K5	CO2
5	20	Describe the following plating types i) Alloy plating ii) Electroless plating.	K4	CO3

Z-Z-Z END