

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECT.M PER 2018
(First Semester)

Branch - CHEMISTRY

PHYSICAL CHEMISTRY !

Time : Three Hours

Maximum : 75 Marks

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 15 ~ 75)

- 1 a Define mean activity coefficient of electrolyte. illustrate its determination by emf method. (5)
- b Describe the dependence of fugacity on pressure and temperature. (5)
- e State and explain Duhem Margules equation. Give its significance. (5)
- "OR
- d What is meant by chemical potential? Give its physical significances. (5)
- e State and explain Gibbs Duhem equation. (5)
- f Describe the variation of chemical potential with temperature and pressure. (5)
- 2 a Give an example for heterogeneous equilibrium and obtain its equilibrium constant. (5)
- b Apply Le Chatelier - Brawn principle to Haber process. (5)
- c State and explain the third law of thermodynamics, (5)
- OR
- d Derive Van't Hoff equation. (5)
- e Deduce the equilibrium constant for equilibrium involving ideal gases. (5)
- f The equilibrium constant of a reaction doubles on raising the temperature from 25^oC to 35^o C. Determine the AH^o for the reaction. (5)
- 3 a Give and explain Debye - Huckel - Onsager equation and its experimental verification, (6)
- h Derive and explain the thickness of ionic atmosphere. Give its significance. (9)
- OR
- c Deduce Debye - Huckel limiting law. Give its application. (5)
- d How is solubility product determined by emf measurement method? (5)
- e What, are reference electrodes? Illustrate with a suitable example. (5)

Cont...

- 4 a Sketch and explain electrolytic current-potential curves. (5)
- b Define over potential, mention the factors influencing over voltage. (5)
- c Derive the zeta potential for electro-osmosis. (5)
- OR
- d Derive and explain the Butler - Volmer and Tafel equations. (10)
- e Define and explain membrane potential. (5)
- 5 a Apply phase rule to Cu and Zn two component system. (5)
- b State and explain simple eutectic system with a suitable example. (5)
- c Give and explain Gibb's phase rule. (5)
- OR
- d What are congruent and incongruent melting systems? Explain with examples. (6)
- e illustrate the application of phase rule to a three component system of a liquid and two solids. (9)

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END