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SUBJECT CODE NO: - 2012
FACULTY OF SCIENCE & TECHNOLOGY
B.Sc. S.Y (Sem-IV)
EXAMINATION JUNE/JULY 2022
Chemistry Paper-XI (Physical Chemistry-II)

[Time: 1:53 Hours]

[Max.Marks:50]

Please check whether you have got the right question paper.

N.B.

- i) Attempt all questions.
- ii) Figures to the right indicate full marks.
- iii) Use of non-programmable calculator is allowed.

- Q.1
- a) What is phase rule? Explain the terms involved in it. 10
 - b) Explain Arrhenius theory of electrolytic dissociation and give its limitations. 10
- OR
- c) Explain effect of dilution on specific and equivalent conductance. Calculate equivalent conductance when 0.5N solution of a salt is placed between two platinum electrodes 2.0 cm apart and area of cross section 4.0 cm² has a resistance of 25 ohms. 10
 - d) Describe construction and working of standard hydrogen electrode. 10
- Q.2
- a) Discuss phenol-water and nicotine-water system. 10
 - b) What is buffer solution? Explain in brief the mechanism of acidic and basic buffer 10
- OR
- Write short notes on (any four) 20
- 1) Advantages of conductometric titrations.
 - 2) Ostwald's dilution law
 - 3) Raoult's law and Henry's law
 - 4) Desilverisation of lead
 - 5) Electrochemical Series
 - 6) Conventional representation of electro-chemical cells.
- Q.3 Choose and write the correct answer of the following 10

1. The phase rule was first discovered by.....
 - (a) Gibbs
 - (b) Nernst
 - (c) Arrhenius
 - (d) Ostwald
2. Number of phases present in water system are
 - (a) 1
 - (b) 2
 - (c) 3
 - (d) 0
3. For one component system the phase rule is
 - (a) F=4-P
 - (b) F=3-P

- (c) $F=2-P$ (d) $F=1-P$

4. The eutectic temperature of silver-lead system is
- (a) 300°C (b) 290°C
 (c) 305°C (d) 303°C
5. For strong electrolytes, the degree of dissociation is
- a) nearly equal to one
 b) nearly equal to two
 c) nearly equal to zero
 d) nearly equal to infinity
6. In Hittorf's method for determination of transport number we make use of a
- (a) H-tube (b) U-tube
 (c) V-tube (d) L-tube
7. Kohlrausch's law can be expressed as
- (a) $\lambda_{\alpha} = \lambda_a - \lambda_c$ (b) $\lambda_{\alpha} = \lambda_c - \lambda_a$
 (c) $\lambda_{\alpha} = \lambda_a + \lambda_c$ (d) $\lambda_{\alpha} = \lambda_a \times \lambda_c$
8. The pH of 0.01M KOH Solution will be
- (a) 1 (b) 2
 (c) 14 (d) 12
9. The cell which converts electrical energy into chemical energy is
- (a) electrolytic cell (b) electrochemical cell
 (c) both a & b (d) none of these
10. The Henderson equation for an acidic buffer is
- a) $\text{pH} = \text{pKa} - \log \frac{[\text{Salt}]}{[\text{acid}]}$
 b) $\text{pH} = \text{pKa} + \log \frac{[\text{Salt}]}{[\text{acid}]}$
 c) $\text{pH} = \text{pKa} - \log \frac{[\text{acid}]}{[\text{Salt}]}$
 d) $\text{pOH} = \text{pKa} + \log \frac{[\text{Salt}]}{[\text{acid}]}$