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(2034)

UG (CBCS) IInd Year Annual Examination

2800

B.Sc. CHEMISTRY

(Solutions, Phase Equilibrium, Conductance, Electrochemistry and Organic Chemistry)

(Core)

Paper : CHEM 201 TH

Time : 3 Hours] **[Maximum Marks : 50**

Note :– Attempt *five* questions in all, selecting *one* question from each Section. Section E is compulsory.

Section–A

1. (a) Differentiate between an ideal and non-ideal solution.

   (b) Explain Raoults law. Discuss the small and large positive deviation from Raoult's law in case of non-ideal solutions.

(c) Define Partially miscible liquids ? What is meant by UCST and LCST ? Give examples. 3,4,3

2. (a) Define terms :

(i) Phase

(ii) Component

(b) Derive the Gibbs Phase Rule equation.

(c) Write the Clausius-Clapeyron equation. Give its application.

(d) Draw and discuss the phase diagram for the water system. 2,3,2,3

Section–B

3. (a) Elaborate what is difference between metallic and electrolytic conductance ?

(b) Define molar conductance. What is meant by conductance at infinite dilution ?

(c) Define Transference number ? Briefly discuss the Hittorf's method in case of non-attackable electrodes. 4,3,3

4. (a) What is electrochemical series ? How is it helpful to determine the *emf* of cell ?

(b) Drive the Nernst equation for *emf* of a cell. Discuss the application to determine the electrode potential of a metal-metal ion electrodes.

(c) What are concentration cells ? Give its types. 3,4,3

Section–C

5. (a) Discuss the alkaline hydrolysis carboxylic acids.

   (b) Explain the Hell–Volhard–Zelinsky reaction.

   (c) Mention briefly, the comparative nucleophilicity of acyl derivatives 3,4,3

6. (a) Write short note on Gabriel's Phthalimide synthesis.

   (b) Discuss Hofmann Bromide reaction.

   (c) What are diazonium salt ? Give their method of synthesis and also give the reaction for its conversion to benzene. 3,4,3

Section–D

7. (a) Define carbohydrates. Discuss their classification.

   (b) Draw the open and cyclic structures of glucose.

   (c) Give one method for ascending in series of monosaccharides. 4,3,3

8. (a) What are polysaccharides ? Give examples and draw the structure of any one.

   (b) Write short note on method of assigning the absolute configuration of monosaccharides.

   (c) What is meant by reducing and non-reducing sugars ? Give examples of each. 3,3,4

Section–E

Compulsory Question

9. Answer as required :

(i) Define mole fraction.

(ii) Define boiling point in term of vapour pressure.

(iii) If degrees of freedom for a system is 'two', then what is meant by it ?

(iv) What product is obtained by the reaction of carboxylic acids with alcohols ?

(v) Why acetic acid is classified as weak acids ?

(vi) Give an example of disaccharide carbohydrate.

State whether True or False :

(vii) For the non-ideal solution, $\Delta V_{mixing} = 0$.

(viii) At triple point the degrees of freedom for water is 'zero'.

(ix) Sucrose has molecular formula $C_{12}H_{22}O_{11}$.

(x) Cellulose is a hydrocarbon. $1 \times 10 = 10$