12322

Reg. No.

III Semester B.Sc. Degree Examination, April-2022
CHEMISTRY
(CBCS New Scheme - Freshers 2021-22 onwards)
Paper : III

Time : 3 Hours   Maximum Marks : 70

Instructions to candidates :
1) **Question paper has two sections, Answer both the sections.**
2) **Write chemical equations and diagrams wherever necessary.**

SECTION - A

Answer any **Five** of the following questions. Each question carries 7 Marks. (5×7=35)

1. a) Construct the Phase diagram of sulphur system and explain its salient features.

   b) What are eutectic mixtures? Give an example.

   c) Define component of a system.   (4+2+1)

2. a) Derive Gibb's phase rule.

   b) Mention the number of phases in the following systems.:

   i) $2Kclo_3(s) \rightarrow 2\,Kcl(s) + 3o_2(g)$

   ii) $Caco_3(s) \rightarrow Cao(s) + co_2(g)$

   iii) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ (4+3)

3. a) Draw a neat plot and explain the variation of molar conductance of a strong and weak electrolyte with dilution.

   b) Define specific conductance and mention its SI unit.

   c) Stat Kohlrauch's law.   (4+2+1)

4. a) How is EMF of a cell determined experimentally by Pogendorff's compensation method?

   b) Define standard electrode potential.

   c) What is transport number of an ion?   (4+2+1)

                                                       [P.T.O.

5. a) Define Nernst equation for a single electrode system.

    b) How is P^H of a solution determined using standard hydrogen electrode?   **(4+3)**

6. a) What is miscibility solution temperature? Discuss the effect of impurity on partial miscibility of liquids.

    b) What are azeotropic mixtures? Give an example for low boiling azeotrope.   **(4+3)**

7. a) What are ideal and non-ideal solutions? Explain negative and positive deviation from Raoult's law in the case of non-ideal solutions.

    b) State Nernst distribution law. Give its applications.   **(4+3)**

SECTION - B

Answer any **Five** of the following questions. Each question carries 7 Marks.   **(5×7=35)**

8. a) Give the mechanism of aldol condensation with an example.

    b) How is 2-propanone prepared from acetyl chloride?

    c) Give the IUPAC name of $H_3C - CH - CH_2 - CHO$ **(4+2+1)**
    $$CH_3$$

9. a) Explain the mechanism of wolf-kishner reduction with an example.

    b) Explain clemmensen reduction with an example.   **(4+3)**

10. a) Explain Hell-Volhard - Zelensky reaction with an example.

    b) How does citric acid react with Hydroiodic acid? Give equation.

    c) Compare the acidic strength of p-nitrobenzoic acid with benzoic acid.   **(3+2+2)**

11. a) Explain the effect of electron with drawing and electron releasing groups on the acidic strength of aliphatic carboxylic acids.

    b) Give the mechanism of knoevanagel condensation with an example.   **(4+3)**

12. a) Explain Hoffmann's bromamide reaction with an example.

    b) How benzene diazonium chloride is converted to p-hydroxy azobenzene?

    c) What is the action of heat on tartaric acid?   **(3+2+2)**

13. a) Explain Gabriel's pthalimide synthesis with an example.
    b) Why is methyl amine a stronger base than ammonia? Explain.
    c) How does ethyl amine react with acetyl chloride?   (3+2+2)

14. a) Explain the following with reference to D-glucose
       i)   mutarotation
       ii) anomeric effect
    b) How is glucose converted to fructose?   (4+3)