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36322

B.Sc. III Semester (CBCS NEW) Degree Examination, March/April - 2022

CHEMISTRY

Chemistry - III

Time : 3 Hours

Maximum Marks : 70

Instructions : *(i)* ***Section - A*** *contains questions from Inorganic, organic and physical chemistry.*

(ii) ***Section - B*** *contains questions from Inorgainc chemistry,* ***Section - C*** *contains questions from organic chemistry,* ***Section - D*** *contains questions from physical chemistry.*

(iii) Answer ***all*** *Sections* ***A, B, C*** *and* ***D.***

SECTION - A

Answer **any ten** of the following. **10x1=10**

1. Why copper becomes green when exposed to moist air for a long time ? **1**

2. Write the unpaired electrons in gaseous species of Mn^{+3}, Cr^{+3} and V^{+3}. **1**

3. Which of the following products are obtained when Na_2CO_3 is added to a solution of copper sulphate ? **1**

4. Which of the following element is not lanthanoide ?
(i) Er, (ii) Pu, (iii) Tm, (iv) Tb. **1**

5. How will you distinguish alkene and alkyl halide by bromine test ? **1**

6. How will you distinguish phenol and ethyl alcohol ? **1**

7. Why ethylene glycol shows high boiling point compared to other alcohols ? **1**

8. What are aliphatic monocarboxylic acids ? Give an example. **1**

9. How does Gibbs energy change with temperature ? **1**

10. What are the factors affecting adsorption ? **1**

11. What is residual entropy ? **1**

12. Write Nernst distribution law for molecular association. **1**

P.T.O.

SECTION - B

Answer **any two** of the following questions. **2x10=20**

13. (a) Discuss the variation of oxidation states and ionization energies of third transition series. **6**
    (b) Describe the catalytic properties of transition elements. **4**

14. (a) What is lanthanide contraction ? Explain the cause and its consequence on electronegativity and basicity of oxides and hydroxides. **6**
    (b) Discuss in brief variable oxidation states of actinides. **4**

15. (a) Discuss Pearson - HSAB principle. **6**
    (b) Write a note on symbiosis. **4**

SECTION - C

Answer **any two** of the following. **2x10=20**

16. (a) Write the structural formula for all alkyl halides of the molecular formula C_4H_9Br, name each according to common and IUPAC system. **6**
    (b) Write distinguish test for primary, secondary and tertiary alcohols by dichromate test. **4**

17. (a) How phenol is prepared from Dow and Cumene process ? **6**
    (b) Explain any three methods for the preparation of monohydric alcohols. **4**

18. (a) Give any three preparation and properties of monocarboxylic acids. **6**
    (b) Write a note on acidity of monocarboxylic acids. **4**

SECTION - D

Answer **any two** of the following questions. **2x10=20**

19. (a) Derive Schrodinger and fundamental wave equation. **6**
    (b) Explain De-Broglie hypothesis. **4**

20. (a) Define third law of thermodynamics and explain the Nernst heat theorem. **6**
    (b) State and explain Carnot's theorem. **4**

21. (a) Explain Langmuir's Adsorption isotherm. **6**
    (b) Derive the partition coefficient for the association of the solute in one of the solvents. **4**

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