93562

Sl.No.

Total No. of Pages : 4

II Semester I Year B.Sc. Examination, September/October - 2022
(Semester Scheme) (CBCS) (2018-19 Batch & Onwards)
CHEMISTRY (Paper - II) (DSC)

Max. Marks : 80

Time : 3 Hours

Instruction : Write equations and draw diagrams wherever necessary.

PART - A

[8 × 1 = 8]

Answer All the questions.

1. a) Name the type of hybridisation in $SiCl_4$.

    b) He_2 molecule do not exist. Why?

    c) Give an example for meta orienting group.

    d) What are annulenes?

    e) What is energy of activation?

    f) Write the unit of rate constant of a II order reaction.

    g) What are detergents?

    h) What are monomers?

PART - B

(Inorganic Chemistry)

Answer any two questions.

[2 × 9 = 18]

2. a) What is lattice energy? Construct the Born-Haber's cycle for the formation of NaCl. [4]

    b) Explain sp^3d^2 hybridisation by taking suitable example. [3]

    c) Mention the factors which favour the formation of covalent bond. [2]

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3. a) Draw the molecular orbital diagram of N_2. Calculate bond order and its magnetic nature. [4]

    b) Explain the shape of H_2O molecule, on the basis of VSEPR theory. [3]

    c) Give the resonance structure of CO_2 and N_2O. [2]

4. a) Explain Fajan's rules of polarisation. [4]

    b) Write the rules of LCAO method. [3]

    c) Dipole moment of CO_2 is zero. Give reason. [2]

PART - C

(Organic Chemistry)

Answer any two questions.   **[2 × 9 = 18]**

5. a) Explain the conformational analysis of butane with energy profile diagram.
https://www.uomonline.com [4]

    b) Explain Huckel's rule with respect to benzenoids. [3]

    c) How do you convert toluene to benzaldehyde? [2]

6. a) Explain the Diel's Alder reactions of anthracene with maleic anhydride. [4]

    b) Explain the S_N2 reaction with energy profile diagram. [3]

    c) Write the structure of Cis-Trans Stilbene. [2]

7. a) Write the resonance structure of naphthalene and anthracene. [4]

    b) Explain Sachse-Mohr theory of strainless rings. [3]

    c) State Saytzeff rule. [2]

PART - D

(Physical Chemistry)

Answer any two questions. $[2 \times 9 = 18]$

8. a) Derive an expression for the rate constant of a II order reaction. When a = b. [4]

    b) Explain the relationship between K_h, K_w, K_a and K_b. [3]

    c) Derive an expression for degree of hydrolysis of NH_4Cl. [2]

9. a) Explain the experimental determination of II order reaction by taking the kinetic study of saponification of an ester. [4]

    b) Discuss Debye-Huckel theory of strong electrolyte. [3]

    c) Calculate the rate constant of a II order reaction, when a=b, which is 30% completed in 60 min. [2]

10. a) Explain the determination of order of reaction by differential and isolation method. [4]

    b) Discuss the kinetics of oxidation of indigocarmine by chloramine-T. [3]

    c) Explain the effect of temperature and dilution on degree of hydrolysis. [2]

PART - E

(General Chemistry)

Answer any two questions. $[2 \times 9 = 18]$

11. a) Explain the determination of molar mass of polymer by osmotic pressure method. [4]

    b) What are the differences between soaps and detergents? [3]

    c) How do you prepare Dimethyl sulphate? Mention its uses. [2]

12. a) Write the structure of Ni^{+2} - DMG & Mg^{2+} - oxine complexes. [4]

   b) What are soaps? Write the types of soaps with examples. [3]

   c) Give an application each of Lithium aluminium hydride and acetic anhydride. [2]

13. a) What is degree of polymerization? Explain the classification of polymers based on arrangement. [4]

   b) What are polymers? Explain the types polymers with examples. [3]

   c) Write the structure of EDTA. [2]

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