

CHEMISTRY HSSC-II

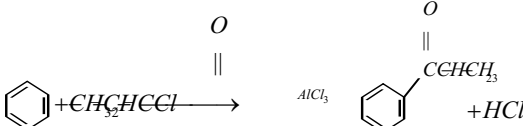


Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

SECTION – B (Marks 42)

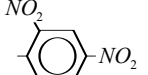

Q. 2 Answer the following questions briefly.

(14x3=42)

| | | | | | |
|--------|---|-----|----|--|----|
| (i) | Write down the reactions of dil. HCl with Li_2O , Na_2O_2 and KO_2 | 03 | OR | What is the significance of dissolved oxygen (DO), Biochemical oxygen demand (BOD) and chemical oxygen demand (COD)? | 03 |
| (ii) | What is the role of effective nuclear charge and number of electronic shells in determining the atomic radii of elements of 3 rd period? | 2+1 | OR | $MgCl_2$ is a high melting solid, $AlCl_3$ is a solid that sublimes at $180^\circ C$ whereas $SiCl_4$ is a volatile liquid. How will you justify this difference in volatility? | 03 |
| (iii) | Why Alkali metals impart different colours to the flame? | 03 | OR | Write down the mechanism of following reaction: $2CH_3 - OH \xrightarrow[140^\circ C]{Conc. H_2SO_4} CH_3 - O - CH_3 + H_2O$ | 03 |
| (iv) | How is BaO prepared? Write down chemical equation to show what happens when: a. BaO is heated in air b. Resulting product is reacted with dil H_2SO_4 | 03 | OR | Identify ligands, co-ordination number and geometry of the following complex ion $[Co(en)_2Cl_2]^+$ | 03 |
| (v) | Write down the reactions of V_2O_5 with HCl , HNO_3 , SO_2 | 03 | OR | Differentiate between atomic emission and atomic absorption spectroscopy. | 03 |
| (vi) | How is $KMnO_4$ used in redox titration with acidified $FeSO_4$? Describe the procedure with chemical equation. | 1+2 | OR | Differentiate between, secondary and tertiary structures of proteins. | 03 |
| (vii) | Write down two similarities and one difference between the members of a homologous series. | 2+1 | OR | Briefly describe the process of spin flipping in NMR spectroscopy. | 03 |
| (viii) | 1-Propanol shows two types of structural isomerism. Name the types and draw the isomers of each type. | 03 | OR | Write down three difference between SN_1 and SN_2 reaction mechanisms. | 03 |
| (ix) | Write down the mechanism for the following reaction of Benzene.  | 03 | OR | What happens when following compounds are reacted with $LiAlH_4$ a. $CH_3 - CN$ b.  c.  $CH_3 - C - OC_2H_5$ $CH_3 - C - NH_2$ | 03 |
| (x) | How SN_2 reaction mechanism can be supported by kinetic and stereochemical evidences? | 03 | OR | Write down three adverse effects of dissolved fertilizers present in water as pollutants. | 03 |
| (xi) | Write down the reactions of $CH_3 - CH_2 - NH_2$ with acetyl chloride, Acetaldehyde, HNO_2 / HCl | 03 | OR | Describe the structural components of nucleotides of RNA. | 03 |
| (xii) | How can Dimethyl ether be prepared by: a. Williamson's synthesis b. From an alkyl halide | 03 | OR | How can Propanoic acid be prepared from: a. A nitrile b. A Grignard reagent c. An Aldehyde | 03 |
| (xiii) | Write down the reactions of 1-Propanol with. a. $SOCl_2$ b. $Conc. H_2SO_4 / 180^\circ C$ c. $K_2Cr_2O_7 / H_2SO_4$ | 03 | OR | Write down the composition and uses of following fractions of Petroleum refining. a. Gasoline b. Naphtha | 03 |
| (xiv) | Write down any two applications of iodoform test with chemical equations. | 03 | OR | 0.240g of an organic compound contain 0.096g of carbon, 0.016g hydrogen and 0.128g oxygen. Determine empirical formula of the compound. | 03 |

SECTION – C (Marks 26)

Note: Attempt the following questions.

| | | | | | |
|-----|---|-------------|----|--|-------------|
| Q.3 | Describe resonance and resonance energy. How can the resonance energy of benzene be calculated with the help of heat of hydrogenation? | 3+4 | OR | Describe polymerization. What are its types? Describe one example of each type with chemical equation for its formation. | 1+2 +4 |
| Q.4 | Why halogens act as oxidizing agents? How is the oxidizing property of halogens represented? What is the order of relative power of halogens as oxidizing agent? Prove this order by giving chemical equations. | 1+1+1 +3 | OR | Write down the reactions of Acetaldehyde and Acetone with. a.  b.  NH_2NH $NH_2 - NH - C - NH_2$ | 3+3 |
| Q.5 | Describe the trends in the following physical properties of elements of 3 rd period. a. Ionization potential b. Melting point and boiling points | 3+3 | OR | How can phenol be prepared from: a. Chlorobenzene b. Cumene c. Aniline | 2+2 +2 |
| Q.6 | What meant by directive influence of substituents on benzene ring? How can substituents be classified on this basis? Give one example of directive influence of substituents for each class with chemical equation. | 1+2+4 | OR | What is IR spectroscopy? Discuss with reference to: a. Reason for absorption of IR-radiations b. IR-spectra c. Application of IR-spectroscopy | 1+2 +2+2 |

SUPPLEMENTARY TABLE

(D) —

| | | | | | | | | | | | | | | | | | | | | |
|-----------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|----|----|----|
| Atomic No | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Symbol | H | He | Li | Be | B | C | N | O | F | Ne | Na | Mg | Al | Si | P | S | Cl | Ar | K | Ca |
| Mass No | 1 | 4 | 7 | 9 | 11 | 12 | 14 | 16 | 19 | 20 | 23 | 24 | 27 | 28 | 31 | 32 | 35.5 | 40 | 39 | 40 |