17326

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Abbreviations used convey usual meaning.

(6) Use of Non-Programmable Electronic Pocket Calculator is permissible.

Marks

1. Answer any FIVE : **5 × 4 = 20**

(a) (i) Define valency. Find valency of manganese in (1) potassium permanganate, (2) potassium chromate.

(ii) Define 'conjugation'. Give an example of compound containing conjugated double bond.

(b) Explain with an example of formation of hydrogen bond.

(c) (i) Define Emperical Formula (E.F.) **(1)**

(ii) Calculate E.F. of a compound having molecular formula $C_8H_6O_4$ and equivalent weight 83. (A.W. : 'H' = 1, 'C' = 12, 'O' = 16) **(3)**

(d) Compare in general aliphatic and aromatic compounds.

(e) Explain KeKule's structure of benzene.

(f) (i) Define an 'isomer'. Write structural formula of isomers of any one organic compound.

(ii) Write structural formula and common name of "Ethanol".

(g) Explain meaning of 'Energy Profile Diagram'.

(h) (i) Define 'asymmetric' carbon atom. Name two asymmetric carbon compounds.

(ii) Define atom, molecule and ion.

2. Answer any TWO : **2 × 8 = 16**

(a) (i) Explain general characteristics of organic compounds.

(ii) Explain importance of organic compounds.

(b) Write common name and IUPAC name of any four :

(i) $(CH_3)_3 - C - CH_2Cl$

(ii) $C_2H_5 - \underset{\underset{C_2H_5}{|}}{C} - C_2H_5$

(iii) $CH_2 = CH - CHO$

(iv) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - COOH$

(v) $CH_3 - \underset{\underset{O}{||}}{C} - C_2H_5$

(c) (i) Explain with reactions, mechanism of bromination of benzene.

(ii) Describe with an example, ‘oxidation’ reaction.

3. Answer any TWO : **2 × 8 = 16**

(a) (i) Compare, giving an example, exothermic and endothermic reaction.

(ii) Write a reversible reaction. Explain conditions which will favour the reaction in forward direction.

(b) (i) Describe with reactions, mechanism of Friedel Craft’s alkylation of benzene. **(6)**

(ii) Write reaction involved in nitration of benzene. Name the type of nitrating mixture used and temperature conditions. **(2)**

(c) Explain with example mechanism of chemical bond formation.

4. Answer any TWO : **2 × 8 =16**

(a) Explain classification of organic compounds based on structure.

(b) (i) Explain with reaction, sulphonation of benzene. **(6)**

(ii) In hydrogenation of benzene, name (1) catalyst system used, (2) product formed. **(2)**

(c) (i) Explain with examples, ‘geometric’ isomerisation.

(ii) Describe ‘optical’ isomerisation with example.

5. Answer any TWO : **2 × 8 = 16**

(a) Write method to detect (any two of the following) in an organic compound.

(i) halide group, (ii) alcohol group, (iii) sulphur element.

(b) (i) Write structural formula and IUPAC name of any two :

(1) methyl bromide

(2) methyl alcohol

(3) isobutyl methyl ether

(ii) State rules for IUPAC nomenclature of alcohols.

(c) Explain with an example :

(i) substitution reaction

(ii) condensation reaction

6. Answer any FOUR : **16**

(a) Explain with an example, formation of (i) covalent bond, (ii) ionic bond.

(b) A compound has weight percent composition : sodium (29.1), sulphur (40.5) and remaining oxygen. Find its E.F. Name the compound (A.W : Na = 23, S = 32).

(c) State general characteristics of aromatic compounds.

(d) Compare aldehydes and ketones. Give an example of each.

(e) Define :

(i) structural isomer

(ii) chiral compound

(iii) plane polarized light

(iv) optically inactive compound

(f) (i) Define :

(1) dextrarotatory molecule

(2) levorotatory molecule

(ii) Represent the two forms in lactic acid. What happens when they are present in equimolar amounts ?

———————