22229

12425

03 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

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

(4) Figures to the right indicate full marks.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define a compound and a molecule.

b) Define aromatic compounds and aliphatic compounds.

c) Draw the structural formula of ethyl methyl ketone and methyl ethanoate. Identify this functional group.

d) Identify the following functional groups:

i) $R - \underset{\underset{H}{|}}{C} = O$

ii) $R - C - O - O - R$

iii) $R - \underset{\underset{O}{||}}{C} - OH$

iv) $R - OH$

e) Define asymmetric carbon atom with an example.

f) Describe the concept of polymer.

g) Draw the structure of polyvings chloride (PVC) and polyethylene.

P.T.O.

Marks

2. Attempt any THREE of the following: **12**

a) Distinguish between ionic and covalent bond with suitable example.

b) Write examples of addition and substitution reactions.

c) Distinguish between hydrogenation and oxidation reactions with suitable examples.

d) Explain the concept of optical isomerism with suitable example.

3. Attempt any THREE of the following: **12**

a) Distinguish between sulphonation and nitration reaction with examples.

b) Explain the process of purification of amino acid.

c) Compare in behaviour on heating a law molecular weight compound like benzene and polymer like polyethylene.

d) Explain the formation of formula of the functional groups esters, ethers and ketones.

4. Attempt any THREE of the following: **12**

a) Explain the rules of IUPAC nomenclature for aldehydes and ketones.

b) Explain the concept of optical isomerism with suitable examples.

c) Explain how polar bond polarity and dipole moment are related to electronegativity.

d) Explain the behaviour of the solubility of polyethylene in a solvent.

e) Explain the concept of bond angle, bond length and bond energy.

Marks

5. Attempt any TWO of the following: **12**

a) Explain the relevant chemical reactions for manufacturing of polyvinyl chloride and polystyrene.

b) A molecule with molecular meight of 180.18 gm/mol is analyzed and found to contain 40% carbon, 6.72% hydrogen and 53.28% oxygen. Calculate the empirical and the molecular formula of the organic compound.

c) Explain the IUPAC rules for acids and write the IUPAC names of the following compounds:

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

ii) $C_2H_5 - CH_3 - CH_3 - OH$

iii) $CH_3 - CH_3 - CH_3 - COOH$

6. Attempt any TWO of the following: **12**

a) Describe Friedel Crafts alkylation and acylation taking the example of benzene and using $AlCl_3$ as applicable.

b) Explain the effect of functionality on the structure of polyethylene and explain the concept of monomer.

c) Distinguish between monomer and polymer on the basis of their structure and chemical properties.
