CS/B.PHARM/SEM-2/PT-204/2013

2013

PHARMACEUTICAL CHEMISTRY

(ORGANIC CHEMISTRY)

Time Allotted : 3 Hours *Full Marks : 70*

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ten of the following : $10 \times 1 = 10$

i) What happens when n-hexane is treated with Cr2O2 supported over alumina at 600°C ?

a) Benzene b) Toluene

c) Methane d) Ethane.

ii) In which reaction, catalyst is not required ?

a) Aromatization b) Diels-Alder reaction

c) Pyrolysis d) Isomerization.

iii) Reduction of acid chloride yields

a) aldehydes b) ketones

c) ethers d) ester.

iv) As the molecular weight of alkanes increases, how do the boiling point and melting point change ?

a) Boiling point increases, melting point increases

b) Boiling point decreases, melting point decreases

c) Boiling point increases, melting point decreases

d) Boiling point decreases, melting point increases.

v) Which of the following compounds is nonpolar ?

a) CO_2 b) CH_3Cl

c) CH_3OH d) $CHCl_3$.

vi) Optically active compounds are the compounds that

a) rotate the sunlight

b) rotate the polarized light

c) rotate the plane polarized light

d) produce polarized light.

vii) Tautomers are

a) resonance structure b) enol & keto structures

c) mirror images d) enantiomers.

viii) If an ester undergoes alkaline degradation then the pH of the medium will

a) increase b) decrease

c) remain the same d) none of these.

ix) Grignard reagent is

a) benzyl chloride

b) alkyl magnesium halide

c) alkyl magnesium sulphide

d) sodium sulphocyanide.

x) Vicinal dihalide means

a) two halogen atoms in one carbon

b) two halogen atoms on two adjacent carbons

c) one halogen atom in one carbon

d) two same halogen atoms on two adjacent carbons.

xi) How many isomers are possible for hexane ?

a) 4 b) 5

c) 6 d) 7.

xii) Which of the following rings has the minimum angle strain ?

a) Cyclopentane b) Cyclohexane

c) Cyclopropane d) Cyclobutane.

GROUP – B

(Short Answer Type Questions)

Answer any three of the following. 3 × 5 = 15

2. What is octane number ? What is its importance in the chemistry of alkanes ? What is TEL ?

3. What do you mean by cis-trans geometrical isomerism ?

4. In case of methyl cyclohexane, methyl group if present at equatorial position will be more stable than axially placed methyl group. Why ?

5. An organic compound (A) C_3H_8O, on dehydration produces (B). (B) on ozonolysis yields one molecule acetaldehyde and one molecule of formaldehyde and (A) responds to Iodoform test. Identify (A) and (B) with proper justifications.

6. Differentiate between (a) alcohol and ethers, (b) aldehyde and ketone.

GROUP – C

(Long Answer Type Questions)

Answer any three of the following. 3 × 15 = 45

7. a) The boiling points of alcohols are more than their corresponding alkanes. Why ?

b) Explain the acidity of primary, secondary and tertiary alcohols.

c) Explain the basicity of primary, secondary and tertiary

amines.

d) How can you separate a pure optically active isomer from its racemic mixture ? 3 + 4 + 4 + 4

8. Prepare any five of the following : 5 × 3

i) Propanoic acid from acetic acid

ii) 1, 4 dioxane from ethylene

iii) Cyclobutane from n-butane

iv) Acetone from acetylene

v) Diethyl ether from ethyl chloride

vi) Isopropyl alcohol from propylene.

9. Explain Saytzeft rule with example. What do you mean by cracking ? What is the importance of cracking in pharmacy ? Describe SN^1 and SN^2 reactions. 5 + 5 + 5

10. Describe LCAO method of molecular orbitals in brief. Define degenerate, antibonding, nonbonding and bonding orbitals. Differentiate between molecular orbital theory and hybridisation theory. Define bond order. 5 + 4 + 4 + 2

11. a) Write shortly on Huckel's rule of aromaticity.

b) Write on any two methods of preparation of arenes.

c) Illustrate with equations, the important chemical properties of benzene and its homologues. 2 + 4 + 9

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