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Total No. of Questions : 11] [Total No. of Printed Pages : 8

PK-410

M.Sc. II Semester Chemistry (Reg./ATKT) Examination June 2018

ORGANIC CHEMISTRY-II

Paper - MCH-407

Time Allowed : Three Hours] *[Maximum Marks : 85*

Note : Attempt all questions.

Section - A

Objective Type Questions

Q.1. Choose the correct answer : 10×1.5=15

i) Which among the following undergoes nitration most readily:

(a) Benzene

(b) Chlorobenzene

(c) Acetanilide

(d) Nitrobenzene

ii) Which of the following will undergo aromatic nucleophilic substitution through benyne intermediate:

(a) Nitrobenzene

(b) p-methoxy chlorobenzene

(c) 2, 6-dimethyl chlorobenzene

(d) 2, 4, 6-trinitro chlorobenzene

iii) Addition of HBr to $CH_3CH = CH_2$ in presence of peroxide yields:

(a) $CH_3CHBrCH_3$

(b) $CH_3CH_2CH_2Br$

(c) $CH_3CHBrCH_2Br$

(d) None of the above

iv) Reaction of silver salt of carboxylic with bromine leading formation of an alkyl halide/ Aryl halide is called :

(a) Sandmeyer reaction

(b) Hunsdiecker reaction

(c) Eglinton reaction

(d) None of the above

v) Which of the following alkene will give optically active product with Br_2/CCl_4 :

(a) 1-Butene

(b) Propene

(c) cis–2–butene

(d) 1-Pentene

vi) Among the following alkenes which has the highest value of heat of hydrogenation:

(a) Ethylene

(b) Propene

(c) 1-Butene

(d) cis-2-butene

vii) Which of the following reaction does not involve enolates in their mechanisms :

(a) Aldol condensation

(b) Knoevenagel reaction

(c) Benzoin condensation

(d) None of the above

viii) The reaction of aldehydes and ketones with phosphoranes or phosohonium yield to produce an alkene is called:

(a) Stobbe reaction

(b) Mannich reaction

(c) Witting reaction

(d) None of these

ix) Which of the following statement is not true in case of pericyclic reactions :

(a) They occur by concerted cyclic shift of electrons

(b) They proceeds with conservation of orbital symmetry

(c) Stereochemistry of the product depends whether the reaction is thermal or photochemical

(d) They smoothly occurs in presence of Catalyst

x) Which of the following is not a true statement in case of Molecular Orbital (M.O.) symmetry of 1, 3-butadiene :

(a) Its Ψ_1 M.O. is mirror symmetric

(b) Its Ψ_2 M.O. is C_2 symmetric

(c) Its Ψ_3 M.O. is mirror symmetric

(d) Its Ψ_4 M.O. is mirror symmetric

Section - B

Short Answer Type Questions

$5 \times 5 = 25$

Q.2. Write a note on Dizonium Coupling.

OR

What is Sommelet-Hauser rearrangement? Explain.

Q.3. Describe allylic halogenation.

OR

Explain Sandmeyer reaction.

Q.4. Write a note on addition to cyclopropane ring.

OR

Explain Michael reaction.

Q.5. Write a note on Witting reaction.

OR

Explain E1cB mechanism for elimination reactions.

Q.6. Explain molecular orbital symmetry of 1, 3-butadiene.

OR

Briefly explain sigmatropic rearrangements.

Section - C

Long Answer Type Questions

$5 \times 9 = 45$

Q.7. Explain any two of the following with reference to Aromatic Electrophilic Substitution:

a) Arenium ion mechanism

b) IPSO attack

c) Vilsmeier reaction

OR

Explain any two of the following with reference to Aromatic Nucleophillic Substitution:

a) Unimolecular mechanism

b) Von Richter rearrangement

c) Smiles rearrangement

Q.8. Discuss mechanism of free radical substitution reactions at aliphatic and aromatic substrates.

OR

Explain any two of the following:

a) Arylation of aromatic compounds by diazonium salts.

b) Free radical rearrangements

c) Mechanism of oxidation of aldehydes to carboxylic acids by free radical mechanism.

Q.9. Discuss mechanistic and stereochemical aspects addition reactions involving electrophiles giving suitable examples.

OR

Discuss any two of the following:

a) Hydrogenation of double bonds

b) Regio-chemoselectivity

c) Sharpless asymmetric epoxidation

Q.10. Discuss mechanism and stereochemistry of E1 and E2 elimination reactions.

OR

Discuss any two of the following:

a) Aldol condensation

b) Benzoin Condensation

c) Reduction of α, β - unsaturated carbonyl compounds by metal hydride like $LiAlH_4$ and $NaBH_4$.

Q.11. Discuss mechanism and stereochemistry of suprafacial and antarafacial cycloaddition reactions. Write their selection rules.

OR

Explain any two of the following:

a) Electrocyclic reactions

b) {2+2} addition of ketenes

c) Ene reaction

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