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B – 4726

Reg. No. : 10/2/17

Name :

First Semester M.Sc. Degree Examination, January 2017

Branch : Chemistry

CH/CL/CA/CM 212 : ORGANIC CHEMISTRY – I

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **any two** among (a), (b) and (c) from **each** question. **Each** sub-question carries 2 marks.

1. a) Write IUPAC names of the following.



- b) What do you mean by cotton effect ?
c) What is atropisomerism ? Explain it with a suitable example.
2. a) How benzyne are generated ? How benzyne are trapped ?
b) How singlet carbene is distinguished from triplet carbene by a chemical method ?
c) Explain why aromatic amines are weaker bases than aliphatic amines.
3. a) Provide a mechanism for the following reaction
$$\text{CH}_3\text{CHBrCHBrCH}_3 \xrightarrow[\text{acetone}]{\text{Zn}} ?$$

b) Compare an E_1 with an S_N1 process.
c) 2-chloro-2, 4, 4 – trimethyl pentane undergoes E_1 reaction to produce an excess of the less substituted alkene (the Hoffmann product). Explain.

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4. a) Illustrate the use of boron hydrides for the transformation of isopropanol to n-propanol.
b) What is Michael addition ? Explain it with a suitable example.
c) How would you prepare the following compound from cyclohexanone ?



5. a) What is R_f value in chromatography ?
b) State the applications of capillary electrophoresis.
c) What is paper chromatography ? Explain how it is useful in identification of α -amino acids. (2×10=20 Marks)

SECTION - B

Answer **either** (a) or (b) of **each** question and **each** question carries 5 marks.

6. a) Write a note on nomenclature of spirocyclic hydrocarbon systems and metal organic compounds.
b) State octant and axial haloketone rules with suitable examples.
7. a) Write a note on structure, formation and stability of carbon radicals.
b) Discuss about different mechanisms in aromatic nucleophilic substitution reaction.
8. a) 2-Bromo-1-phenyl propane reacts with NaOEt in E to H to give only 1-phenylpropene and the trans-isomer of the product predominates over the cis-isomer. Explain this observation.
b) Discuss about the effect of leaving group and substrate structure in nucleophilic substitution reaction.
9. a) Write a note on mechanism of esterification and ester hydrolysis.
b) On bromination cis-2-butene gives only dl-2, 3-dibromobutane and trans-2-butene gives only the meso-dibromide. Give the mechanism and stereochemistry of addition of bromine to these isomeric-2-butenes.
10. a) Explain how TLC is superior over column chromatography.
b) Write a note on "Solvent extraction". (5×5=25 Marks)



SECTION - C

Answer **any three** questions and **each** question carries **10** marks.

11. Give a brief account on effect of conformation on reactivity of cyclohexane and decalin derivatives.
12. Discuss about the reactivity and orientation effects of substituents in aromatic electrophilic substitution reactions.
13. Explain the following :
 - a) Non-classical carbocations.
 - b) Competition between S_N1 and S_N2 .
14. Discuss the following :
 - a) Mechanism and stereochemistry of addition to $C = O$ systems.
 - b) Cis and trans hydroxylation of cycloalkenes.
15. Explain the following :
 - a) Adsorption and partition chromatography.
 - b) Detectors.

(3×10=30 Marks)
