



DCA – 530 (App. Che)

M.Sc. Previous (Applied Chemistry) Degree
Examination, August/September 2010
Directorate of Distance Education
DEC.APP.CHEM.1.03 : ORGANIC CHEMISTRY

Time : 3 Hours

Max. Marks : 85

Instructions : 1) Answer any ELEVEN questions from Part-A, any THREE questions from Part-B and any THREE questions from Part-C.

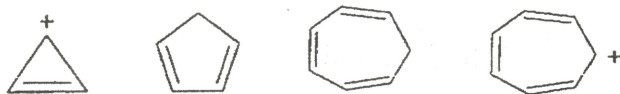
2) Figures to the right indicate marks.

PART – A

Answer any ELEVEN questions :

(11×2=22)

1. a) What are non-classical carbocations ?
- b) Explain with suitable example the terms enantiomers and diastereomers.
- c) Give the reaction involving carbocation as reaction intermediate.
- d) Write the possible optical isomers for lactic acid.
- e) Explain S_N1 reaction with an example.
- f) State with justification, which of the following are aromatic.



- g) Write the mechanism of nitration of benzene.
- h) Illustrate and state Markonikov's rule of addition of hydrogen halide to any olefin.
- i) Explain E2 reaction with an example.
- j) Give one method of synthesis of pyrimidine.

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- k) What is anomeric affect ?
- l) Arrange the following acids in the increasing order of their acid strength :
 ClCH_2COOH , CH_3COOH , Cl_3CCOOH and $\text{Cl}_2\text{C(R)COOH}$
- m) Name any two amino group blocking agents used in the peptide synthesis.
- n) Write a reaction which involves carbene as reaction intermediate.
- o) Write the structures of isoxazole, oxazole, pyrazole and imidazole.

PART – B

Answer any **THREE** of the following questions : (3×8=24)

2. a) How are carbanions generated ? Give an account of structure, stability and any two reactions of carbanions.
- b) Explain Huckel's rule of aromaticity. (6+2)
3. a) Discuss the conformational analysis of cyclohexane.
- b) Write briefly on optical isomerism exhibited by spiranes. (5+3)
4. a) State and explain Saytzeff-Hofmann rules in elimination reactions.
- b) Discuss the mechanism of Friedel-Crafts alkylation. (5+3)
5. a) Outline the mechanism of Fischer indole synthesis.
- b) Discuss the effect of substituents on the strength of organic bases with appropriate examples. (4+4)
6. a) Write a note on biological importance of proteins.
- b) Elucidate the structure of maltose. (4+4)



PART – C

Answer any **THREE** of the following :

(3×13=39)

7. a) Discuss Bruce-Merrifield synthesis of polypeptide.
b) Write a note on Hudson's rule. (8+5)
8. a) Enlist various methods available for the synthesis of quinoline and explain Skarup's method for their synthesis.
b) Give an account of nucleophilic substitution reactions of pyridine. (8+5)
9. a) Explain the mechanism of E1 reaction and predict the stereochemistry involved in it.
b) Account for stereochemistry of S_N2 reactions. (7+6)
10. a) Discuss with suitable examples the effect of substituents on orientation and reactivity in monosubstituted aromatic compounds in electrophilic substitution reactions.
b) How would you determine the configuration of geometrical isomers by physical methods ? (8+5)
11. a) How are free radicals generated ? Give an account of structure, stability and any two reactions involving free radicals.
b) Write a note on effect of solvent and nature of substrate on S_N1 and S_N2 reactions. (7+6)