PG – 227

I Semester M.Sc. Examination, Jan./Feb. 2018
(CBCS Scheme)
CHEMISTRY
C 102 : Organic Chemistry – I

Time : 3 Hours Max. Marks : 70

Instruction *: Answer question No.* ***1*** *and* ***any five*** *of the remaining.*

1. Answer **any ten** of the following : **(10×2=20)**

a) Give an example each for conjugated and cross conjugated compounds.

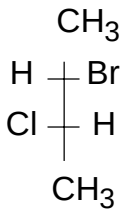
b) Draw the structure of [10]-annulene and comment on its aromaticity.

c) Arrange the following in the decreasing order of acidity and offer a proper justification.

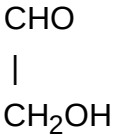
Cl_3CCOOH, CH_3CH_2COOH, CF_3COOH, CH_3COOH, HCOOH.

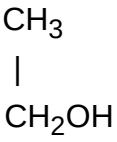
d) What are ambident substrates ? Explain with suitable examples.

e) Convert the following projection into Newman and Sawhorse projections.



f) Indicate (if any) the prochiral groups and prochiral faces in the following :

i) 

ii) 

g) Draw all possible conformers of cyclopentane and comment on their stability.

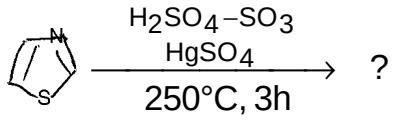
h) What is Kiliani-Fischer synthesis ? Explain with an example.

i) Draw the structure of :

i) Gentiobiose

ii) Meliobiose.

j) Predict the product and propose a suitable mechanism.



k) Give any one synthesis of coumarin.

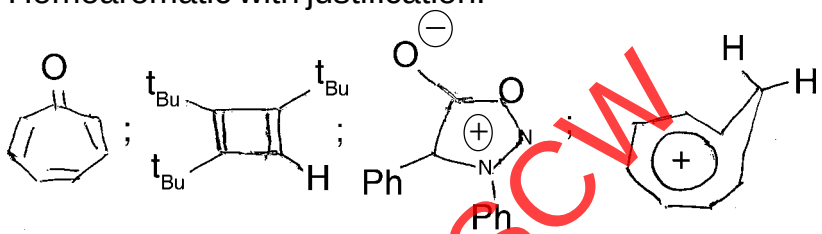
l) Explain how pyridoxine is converted into pyridoxal and pyridoxylamine.

2. a) Indicate the following as :

i) Aromatic

ii) Antiaromatic

iii) Homoaromatic with justification.



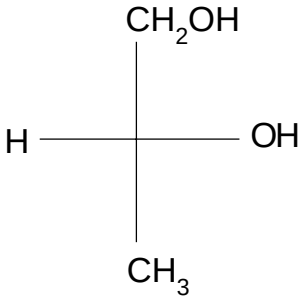
b) Draw the structures of :

i) Carbanion

ii) Carbon free-radical and comment on their stability. **(6+4=10)**

3. a) Give an account of Hammett equation and linear free energy relationship.

b) What are CIP rules ? Explain how the these rules are used to determine the R/S configuration of the following molecule. **(6+4=10)**



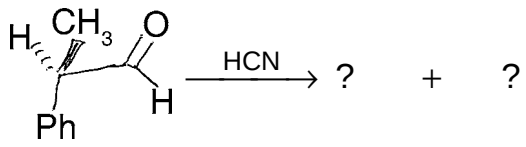
4. a) Write briefly on nomenclature of fused and bridged ring systems.

b) Explain the method of determination of configuration of any one monosaccharide.

c) Elucidate the structure of sucrose. **(3+3+4=10)**

5. a) Give one synthesis and any two reactions of :
   i) Imidazole
   ii) Pyrimidine.
   b) Sketch the synthesis of riboflavin. **(6+4=10)**

6. a) Write notes on :
   i) Curtin Hammett principle.
   ii) Use of isotope labelling in the determination of reaction mechanisms.
   b) What is Cram's rule ? Explain how this rule is used to predict the product of the following reaction. **(6+4=10)**



Major Minor

7. Outline the synthesis of the following :
   a) N-acetylmuramic acid
   b) Galactosamine
   c) Vitamin A1. **(3+3+4=10)**

8. a) What are hard and soft bases ? Explain with suitable examples.
   b) Give a brief account of conformational analysis of cyclohexane-1, 3-diol.
   c) Sketch a synthesis of indole. **(3+3+4=10)**