Registration No: | | | | | | | | | | |

Total Number of Pages: 02 **MSc.**

MCYC102

1st Semester Back Examination 2017-18
ORGANIC CHEMISTRY
BRANCH(S): M.Sc. (AC)
Time: 3 Hour
Max marks: 70
Q.CODE : B840
Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Which is more stable among methyl α-D glucopyranoside and methyl β-D glycopyranoside?
b) What is tautomerism? Discuss the conditions that favors the formation of enol form in keto-enol tautomerism?.
c) State Hammonds postulate.
d) Among Cycloctatetraene and Azulene which is aromatic and why?
e) What is Nitrene? What are the different types of nitrene?
f) What is non classical carbocation? Explain with an example.
g) What will happen when aniline reacts with methyl chloride in presence of $AlCl_3$?
h) What is cross conjugation? Explain with suitable examples.
i) What is Huckel's rule? Sate the different conditions for aromaticity.
j) Arrange 1º, 2º and 3º free radicals in the increasing order of their stability.

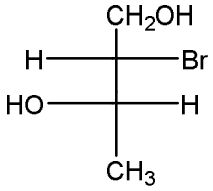
Q2 **a)** Give a brief account of conformational analysis of cyclohexane. Draw the energy profile diagram for the stability of its different isomers. **(4)**
b) What are the factors affecting the stability of various conformations of cyclohexane? **(3)**
c) Draw the different conformations possible for dimethyl substituted cyclohexane. Give their stability order. **(3)**

Q3 **a)** What is HSAB principle? Discuss the criterion for soft and hard acid bases with suitable example. **(5)**
b) Define borderline acids and bases with examples. **(2)**
c) How HSAB principle applicable to different organic synthesis? **(3)**

Q4 **a)** What is a carbocation? Give a method of generation of carbocation. **(3)**
b) Explain the structure of carbocation. Classify different types of carbocations and discuss their stability. **(5)**
c) Give an example of a reaction involving carbocation intermediate. **(2)**

Q5 **a)** Define enantiomers and diastereomers with suitable examples. **(4)**
b) What do you mean by stereoselective and stereospecific synthesis? **(2)**
c) Identify R,S configuration of the following compounds: **(4)**

(i)



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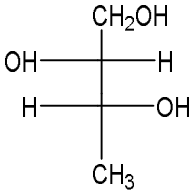

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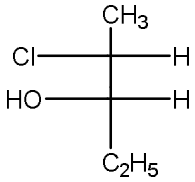

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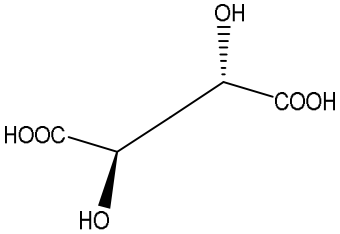

Q6 **a)** What is a nucleophilic substitution reaction? Discuss briefly about S_N1, S_N2 reactions. How solvent plays a significant role for these reactions? **(6)**

b) What is aromatic electrophilic substitution reaction? Give the mechanism of Friedel-Crafts alkylation and acylation. **(4)**

Q7 **a)** What do you mean by kinetic and thermodynamic controlled reactions? Explain with suitable example. **(4)**

b) What is isotope effect? How this can be a useful method in determining the reaction mechanism? **(3)**

c) What is anchimeric assistance? Discuss its significance in organic reaction. **(3)**

Q8 **Write short notes on the following rearrangements.** **(4+3+3)**

i) Smiles rearrangement
ii) Sommelet-Hauser rearrangement
iii) Von-Richter rearrangement