Set I

M.Sc (Chemistry)
Semester - IV
EC-4
(Organic Chemistry Special)

Full Marks = 70

Dr. Brajesh Kumar
Assistant Professor
Department of Chemistry
Tata College, Chaibasa

1. Answer the following questions : MCQ, True-False and fill in the blanks
1×10 = 10 Mark

a) Difference in rate between SN^2 reactions are mainly due to
i) Polar factor
ii) steric factor
iii) Both (a) and (b)
iv) None of these

b) Catenanes are compounds containing
i) Charge transfer compounds
ii) Inclusion compounds
iii) Interlocked rings
iv) Clathrate compounds

c) Basic unit of heterocyclic group present in DNA/RNA is
i) Pyridine
ii) Pyrrole
iii) Furan
iv) Pyrimidine

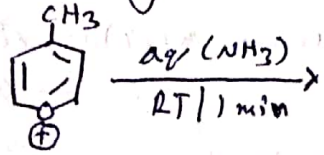
d) Main role of vitamin B_1 (Thiamin) as co-enzyme to transfer
i) Two carbon atoms
ii) Acyl group
iii) Electron
iv) All of these

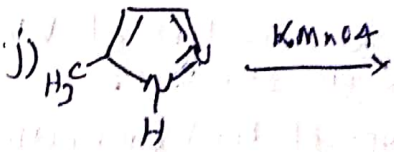
e) Vitamin _____ is containing adenine and pteridine ring.

f) Phenanthrene ring is backbone of Vitamin _____.

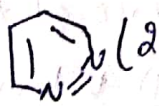
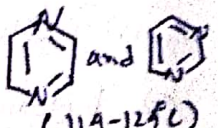
g) The Hammet reaction constant rho (ρ) will _____ value, when aromatic rings attached with electron donating group.

h) Mechanism of reaction may be studied with the help of Isotopic labelling. (True / False)

i) 

j) 

2. a) Establish the constituent of Vitamin C. Explain its synthesis from sugar. What are the importance of Vit C in our body. 12 Mark

b) Why boiling point of  (207°C) is higher than  and . (114-125°C) -3 Marks

3. a) Discuss the various types of steric strain and its influence on reaction with suitable example. 5 marks

b) Write short notes on hard-soft concept of acid-bases with respect to organic reactions. 5 marks

c) Compare S_N1 and S_N2 reaction with suitable examples 5 marks

4. a) Synthesize the following compounds with given chemicals (Any Three) 4×3 = 12 marks

i) Chromones from O-Hydroxy acyl benzene and Ester.

ii) α-pyrones from Malic acid

iii) Coumarins from phenol and Ethyl aceto acetate

iv) Pyridazines from 1,4-dicarbonyl compound and hydrazine

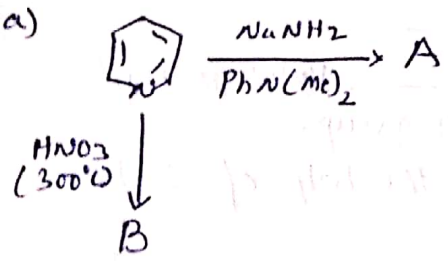
b) Brief the importance of Coumarin and Chromones. 3 Marks

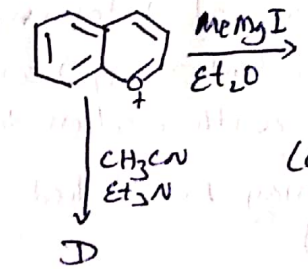
5. a) How heterocyclic compounds are different from normal carbocyclic compounds. Give few examples. 6 Marks

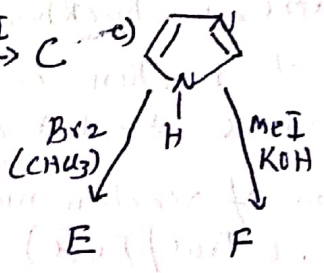
b) Write the structure of any pyrazole, Thioxazole and diazine (at least one from each group) 3 Marks

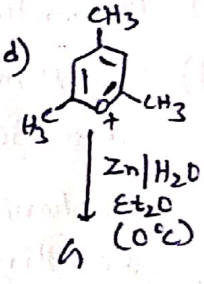
c) Draw the structure of Cynidine Chloride at different pH. 6 Marks

6. Complete the following reactions:

a) 

b) 

c) 

d) 

7. a) Suggest the structure of Vitamin A. Write their chemical reaction which confirms its structure. — 08 Marks

b) Which type of bonds are mostly involved in supramolecular chemistry. Highlight its importance in applied chemistry. — 04 Marks

c) 18-Crocon-6 compounds is more selective for which alkali metal ion. Draw the binding structure of metal ion with 18-Crown-6 — 03 Marks

8. Write short notes on any three of the following: 5×3 = 15 Marks

a) Vitamin D

b) Isotopic effect

c) Cyclodextrin

d) Vitamin B_1

e) Curve crossing approach

Set II

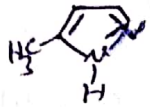
M.Sc (Chemistry)
Semester - IV
EC-4
(Organic Chemistry Special)

Full Marks = 70

Answer any Five Questions in which Q. NO-1 is compulsory

1. Answer the following questions : MCQ, True-False and fill in the blanks. 1X10 = 10 marks

a) Basic unit of Heterocyclic group present in DNA and RNA is:
i) Pyridine ii) Pyrrole iii) Pyrimidine iv) Furan

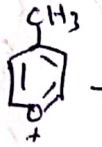
b)  ?

c) Vitamin _____ is containing adenine and pteridine ring.

d) Diffrence in rate between S_N2 reactions are mainly due to:
i) Steric factor iii) Both (a) and (b)
ii) Polar factor iv) None of these

e) Phenanthrene ring is backbone of Vitamin _____.

f) Mechanism of reaction may be studied with the help of Isotopic labelling. (True/False)

g)  ?

h) Catenanes are compounds containing
i) Interlocked rings iii) Inclusion compounds
ii) Charge transfer compounds iv) Clathrate compounds

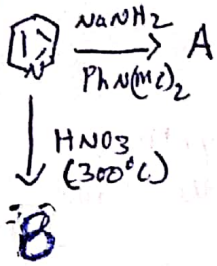
i) The Hammet reaction constant (ρ) rho will _____ value Charge, when aromatic ring attached with electron donating group.

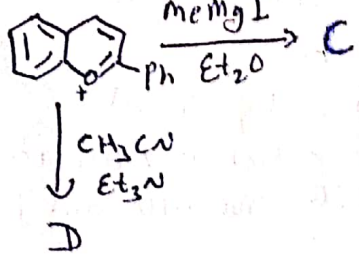
j) Main role of Vitamin B_1 (Thiamin) as co-enzyme to transfer
i) Two carbon atoms iii) Acyl transfer
ii) oxidation-Reduction iv) All of the above

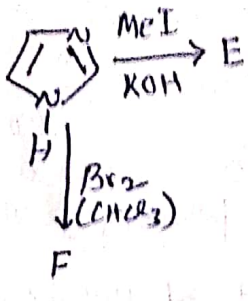
2. a) Give synthesis of any three of the following: 4X3 = 12 Marks
i) Coumarins from phenols and Ethyl acetoacetate
ii) Chromones from O-Hydroxy acyl benzene and ester
iii) α-pyrones from Malic acid
iv) Pyridazines from 1,4-dicarbonyl compound and hydrazine.

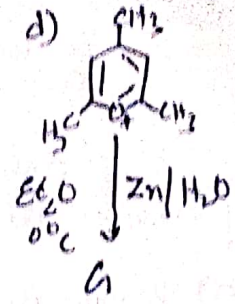
b) Brief the importance of Coumarin and Chromones. 3 Marks

Complete the following chemical Reactions! 15 Marks

3. a) 

b) 

c) 

d) 

4. a) Establish the Constitution of Vitamin C. 12 Marks

b) How Vitamin C actin as an antioxidant ? 03 Marks

5. a) Draco the structure of of Retinol, Retinal and Retanoic acid. Highlight the physical property of Vitamin A. 08 Marks

b) which type of bond is mostly involved in supramolecular chemisky. Highlights its importand in applied Chemistry — 03 Marks

c) 18 Crown 6 (compounds) is more selective for which alkali metal con. Draco the binding structure of metal with 18-Crown-6. — 4 Marks

6. a) How heterocyclic Compounds are diffent from normal Carbocyclic Compounds. Give few examples. 06 Marks

b) Draco the structure of Cynidine Chloride at diffent pH. 06 Marks

c) why boiling point of  (207°C) is higher than  and  (119-124°C) 03 Marks

7. a) Discuss the various types of steric Strain and its influence on reaction with suitable examples. 5 Marks

b) Compare the S_N1 and S_N2 reaction with suitable examples 5 Marks

c) Write short notes on hard-Soft Concept of acids and bases with respect to organic reactions. 5 Marks

8. Write short notes on any three of the following! 5x3 Marks.

a) β-Carotenes

b) Isotopic effect

c) Curve. Crossing approach

d) Cyclodextrin

e) Vitamin D

f) Linear free Energy Relationship

Set III

M.Sc
(Chemistry)
Semester IV
EC-A
(Organic Chemistry special)

Full Marks = 70

Dr. Brajesh Kumar
Assistant Professor
Department of Chemistry
Tata College, Chaibasa

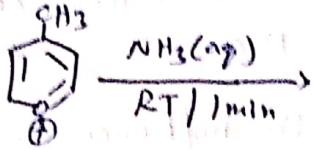
24/4/2020

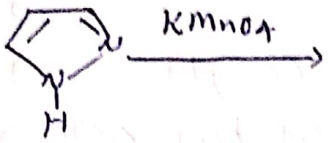
1. Answer the following questions : MCQ, True-False and Fill in the blanks

a) Vitamin _____ is containing adenine and pteridine ring

b) The Hammet reaction constant rho (ρ) will be _____ value, when aromatic rings attached with electron withdrawing group.

c) Phenanthrene ring is backbone of Vitamin _____.

d) 

e) 

f) Isotopic labelling may be used to study mechanism of reaction. True/False

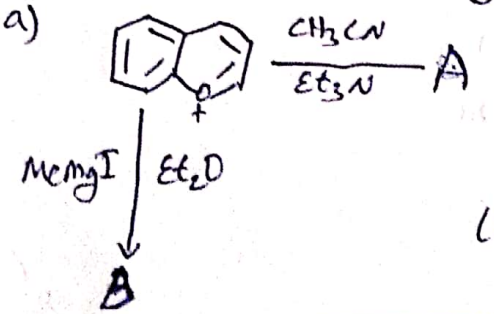
g) Main role of Vitamin B_1 (Thiamin) as Co-enzyme to :
i) transfer two carbon atoms
ii) transfer electrons
iii) transfer acyl group
iv) All of these

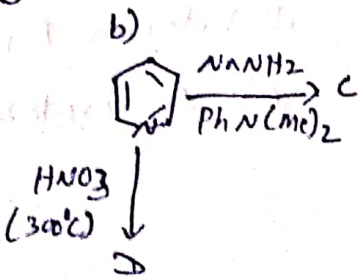
h) Difference in rate between S_N2 reactions are mainly due to
i) Polar factor
ii) Steric factor
iii) Both (a) and (b)
iv) None of these

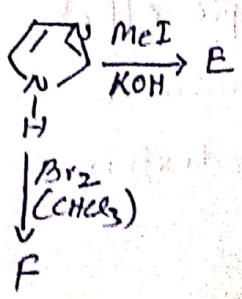
i) Catenanes are compounds containing
i) Charge transfer compounds
ii) Interlocked compounds
iii) Inclusion compounds
iv) Clathrate compounds

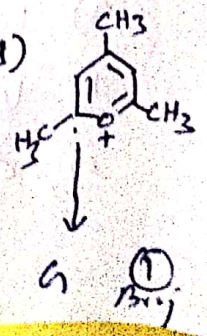
j) Basic unit of heterocyclic group present in DNA/RNA is
i) Pyrimidine
ii) Pyrrole
iii) Pyridine
iv) Furan

2. Complete the following reactions : 15 Marks

a) 

b) 

c) 

d) 

3. a) Establish the main constituent of Vitamin C. Explain its synthesis from sugar. What are the importance of Vitamin C in our body — 12 Marks

b) Write the chemical structure of pyrazole, diazine and thioxazole — 3 Marks

4. a) Suggest the structure of Vitamin A. Write their chemical reactions which confirms its structure — 08 Marks

b) Which type of bonds are mostly involved in Supramolecular chemistry. Highlight its importance in applied chemistry. — 04 Marks

c) 18-Crown-6 compounds are more selective for which alkali metal ions. Draw the binding structure of metal ion with 18-Crown-6 — 03 Marks

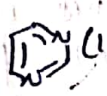
5. a) Discuss the various types of steric strain and its influence on reaction with suitable examples. — 5 Marks

b) Compare S_N1 and S_N2 reactions with suitable examples. — 5 Marks

c) Write short notes on hard-soft concept of acid-base with respect to organic reactions. — 5 Marks

6. a) How heterocyclic compounds are diffrent from normal carbocyclic compounds. Give few examples. — 6 Marks

b) Draw the structure of Cynidine Chloride at diffrent pH. — 6 Marks

c) Why boiling point of  (207°C) is higher than  and  (114-124°C) — 3 Marks

7. a) Synthesize the following compounds with given starting chemicals (Any Three) — 4×3 = 12 Marks

i) Chromones from O-Hydroxy acyl benzene and Ester
ii) Coumarins from phenol and ethyl acetoacetate
iii) α-pyrones from Malic acid
iv) Pyridazines from 1,4-dicarbonyl compound and hydrazine

b) Brief the importance of Chromones and Coumarins. — 3 Marks

8. Write short notes on any three of the following: — 5×3 = 15 Marks

a) Isotopic effect
b) Vitamin D
c) Cyclodextrin
d) Vitamin B_1
e) β-Carotene