

KATHMANDU UNIVERSITY
End Semester Examination [C]
November/December, 2023

Marks Scored:

Level : B.Pharm.

Year : I

Exam Roll No. :

Time: 30 mins.

Course : CHEM 104

Semester : II

F. M. : 20

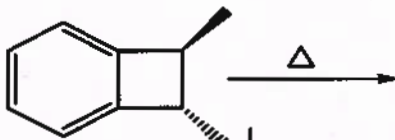
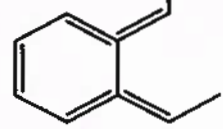
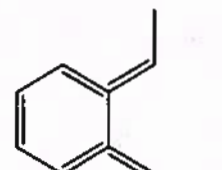
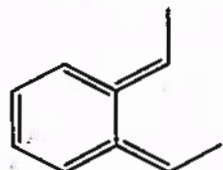
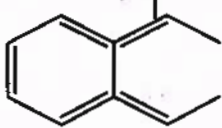
Registration No.:

Date

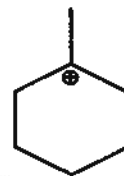
06 DEC 2023

SECTION "A"
[20 Q. × 1 = 20 marks]

Choose and mark [X] in the most appropriate option.

- The following compounds follow Huckel's rule except
 Furan Anthracene Cyclohexane Pyrrole
- Activation energy is
 The additional energy required over kinetic energy of molecules to convert into product.
 The minimum amount of energy required for molecules to convert into product.
 The maximum amount of energy required for molecules to convert into product.
 None of the above.
- The major product of the following reaction is

  
  
- What condition favor's the production of Hoffmann product?
 Steric hinderance Strong leaving group
 Decreased electronegativity Low heat
- The increasing order of leaving group in nucleophilic substitution reaction is
 $\text{Br}^- < \text{Cl}^- < \text{OH}^-$ $\text{Cl}^- < \text{Br}^- < \text{OH}^-$
 $\text{OH}^- < \text{Cl}^- < \text{Br}^-$ $\text{Br}^- < \text{OH}^- < \text{Cl}^-$

6. What is the hybridization of the carbon containing positive charge?
 sp sp^2 sp^3 dsp^2



7. Which of the following is not the product of reaction of benzene with CH_3Cl in presence of $AlCl_3$?

- Toluene Isopropyl benzene
 o-Xylene *p*-Xylene

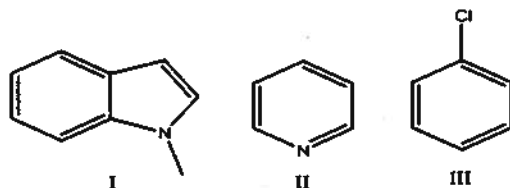
8. Formation of aspirin from the reaction of salicylic acid and acetic anhydride is an example of

- Friedel-Craft alkylation Friedel-Craft acylation
 Halogenation Sulfonation

9. Which of the following solvent is aprotic solvent?

- HF N_2O_4 MeOH H_2SO_4

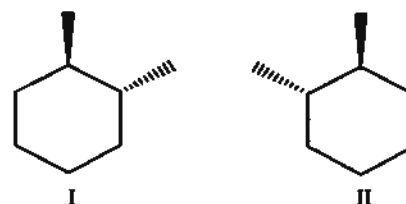
10. The correct order for the rate of electrophilic aromatic substitution reaction is



- I > II > III II > I > III III > II > I I > III > II

11. In the give compounds, structure I and II are

- Meso compound
 Enantiomer
 Diastereomer
 Identical

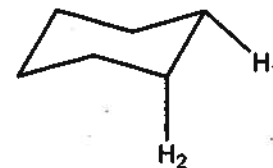


12. Shifting of electrons of a multiple bonds under the influence of reagent is called

- I-effect M-effect E-effect T-effect

13. In the following chair structure of cyclohexane, hydrogen H_1 and H_2 are

- Axial-equatorial Equatorial-axial
 Axial-axial Equatorial-equatorial

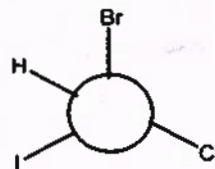


14. The energy of half chair conformer of cyclohexane is

- 0 K Cal 5.5 K Cal 7.1 K Cal 11 K Cal

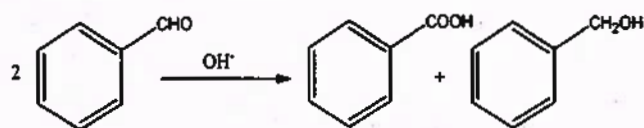
Fill in the blanks

15. The configuration of given compound is



16. Diel's Alder reaction is one of the example of

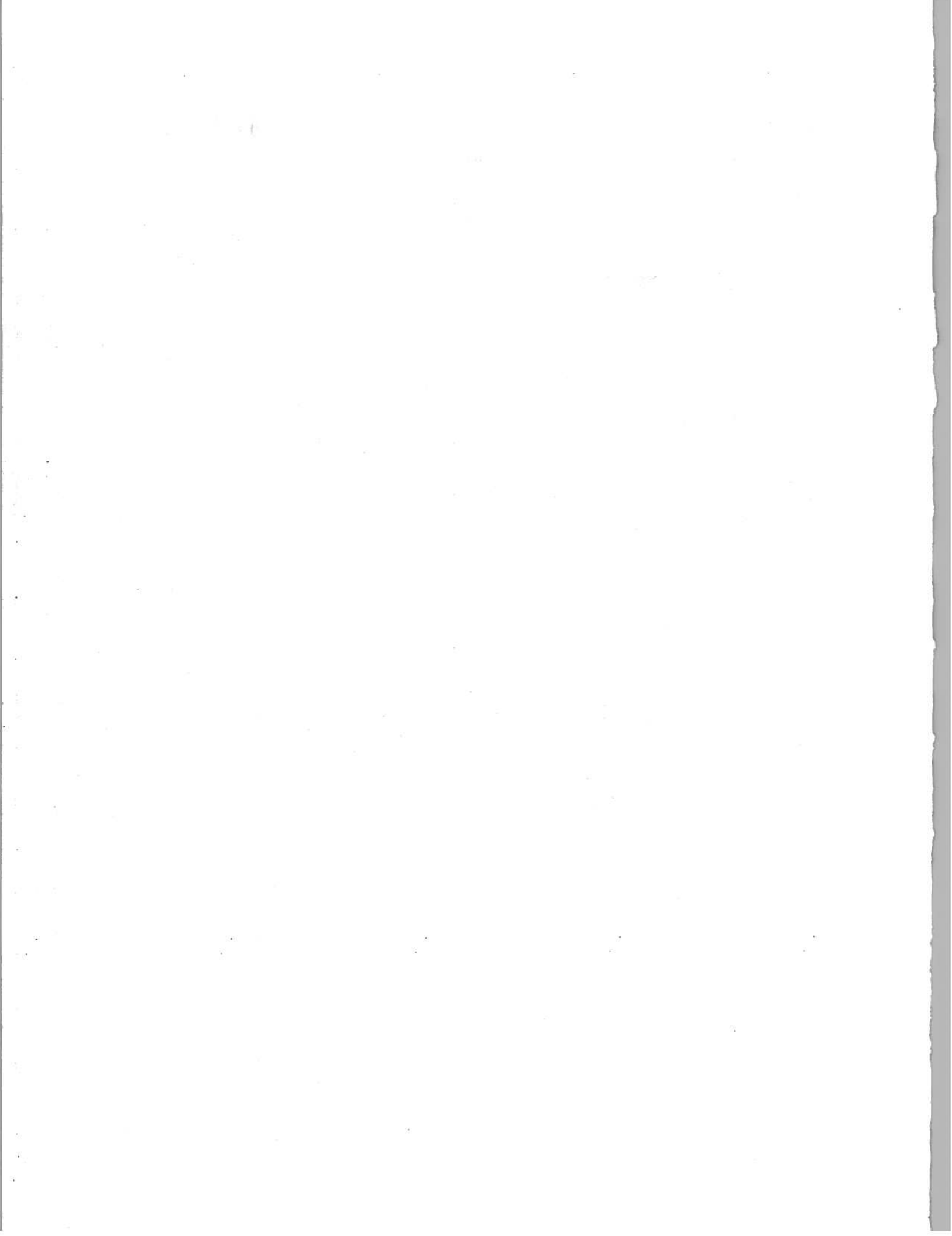
17. The name of the following reaction is



18. The stereochemistry of the product in $\text{S}_{\text{N}}2$ reaction is

19. The optical purity of racemic mixture is

20. The quaternary salt is an example of



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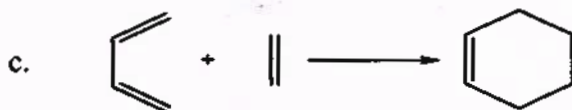
06 DEC 2023
Course : CHEM 104
Semester : II
F. M. : 55

SECTION "B"

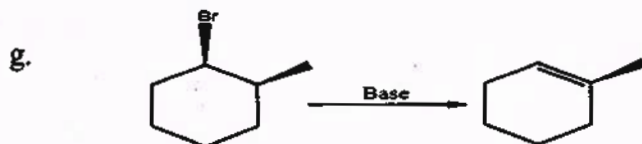
Attempt the following questions.

1. Give the mechanism for the following reactions (*ANY SIX*). [6Q × 2.5 = 15]

- Kolbe reaction
- Bromination of methane in presence of light

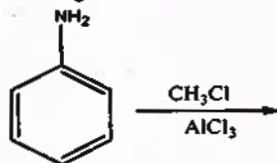


- Sulfonation reaction
- Fries rearrangement reaction



2. Give the reasonable explanation for the following statements (*ANY FIVE*). [5Q × 2.5 = 12.5]

- In $\text{S}_{\text{N}}1$ reaction the stereochemistry of the product is racemic mixture.
- The eclipsed conformer of ethane is least stable than that of its staggered.
- In E_1 reaction the stability order of alkyl halide is $3^\circ > 2^\circ > 1^\circ$.
- Racemic mixture is optically inactive.
- The chair form of cyclohexane is most stable among all conformers.
- The following reaction doesn't give Friedel-Craft reaction.



3. Explain the followings with examples (*ANY FIVE*). [5Q × 2 = 10]

- Inductive effect
- Generation of chiral centre
- Markonikov's rule
- Transition state theory
- Huckel's rule
- Chromatography

4. Convert the following compounds to the respective products by giving the appropriate reactions (*ANY FIVE*). [5Q × 2 = 10]

- Ethanoic acid to methyl methanoate
- Ethene to cyclopropane
- 1,3-Butadiene to cyclohexene
- Ethanol to ethoxy ethane
- Benzaldehyde to toluene
- Propanol to 2-chloropropane

5. Give the products.

[5Q × 1.5 = 7.5]

