

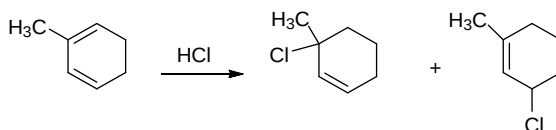
**M.SC. DEGREE END SEMESTER EXAMINATION NOVEMBER 2016****SEMESTER - 1: CHEMISTRY****COURSE: 16P1CHET02, 16P1CPHT02 -: BASIC ORGANIC CHEMISTRY**

Time: Three Hours

Max. Marks: 75

**SECTION A***(Answer any ten questions. Each question carries 2 marks)*

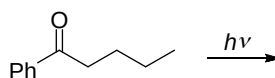
- Write Newman projection formula for the following compounds
  - Meso-2,3-dichlorobutane
  - Threo-2,3-diaminopentane
- Draw and specify as *R* or *S* the enantiomers (if any) of
  - 3-chloro-2,2,5-trimethylhexane
  - 1,3-dichloropentane
- Predict the most stable conformation for the following compounds
  - 3,4-dimethyl-1-methoxycyclohexane
  - 4-methyl-tert-butylcyclohexane
- Differentiate between Stereoselective and Stereospecific reactions?
- Draw four resonance structures for anthracene.
- Cyclohexane exists only in *cis* form, while cyclodecane exists both in *cis* and *trans* forms. Why?
- $\beta$ -D-Glucose is more stable than  $\alpha$ -D glucose. Give explanation.
- Label each product in the following reaction as 1,2-product or 1,4-product, and identify the kinetic and thermodynamic product.



- Compound A is more stable than compound B. Explain.



- Identify the major product(s) in the following photochemical reaction



11. Norbornene reacts with benzophenone triplet to give oxetane, while it reacts with acetone triplet to give its dimer. Account.
12. A natural product was isolated in the laboratory, and its observed rotation was  $+10^\circ$  when measured in a 1 dm sample tube containing 1.0 g of compound in 10 mL of water. What is the specific rotation of the compound?
13. What are the structural factors supporting Hofmann elimination products over Saytzeff elimination products? Illustrate with an example.

(2 x 10 = 20)

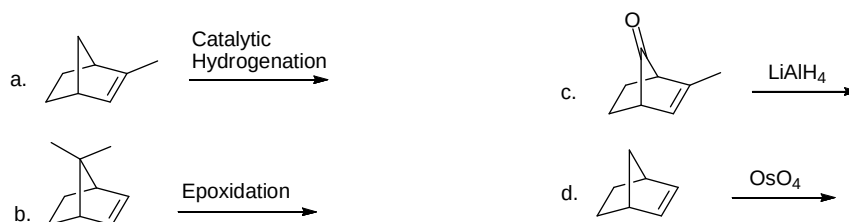
## SECTION B

(Answer **five** questions by attempting **not more than 3** questions from each **bunch**.)

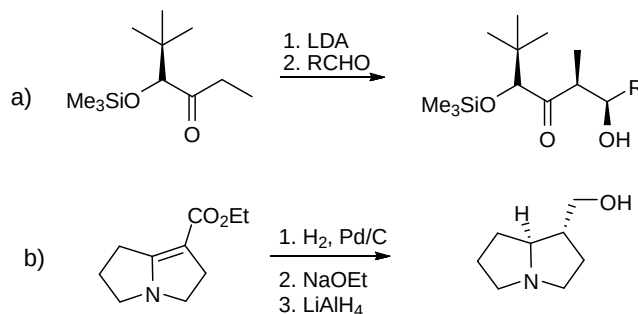
Each question carries 5 marks each)

### Bunch 1(Problem Type)

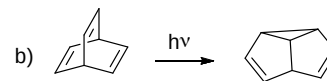
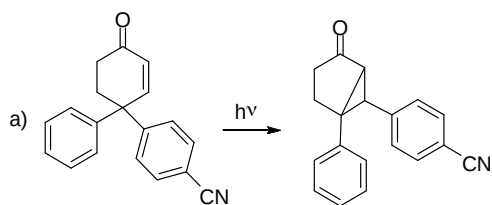
14. Predict the product(s) of the following reactions with correct stereochemistry



15. Explain the stereo chemical control on the following reactions showing all the intermediates?



16. Provide the mechanism of the following photochemical transformations



17. Draw structural formula for each of the following compounds. Identify all pairs of heterotopic faces and tell whether the members of each pair are enantiotopic or diastereotopic, Specify each face as *Re* or *Si*.

- Propionaldehyde
- 3-bromo-2-methylpropene
- (*R*)-3-methyl-2-pentanone
- (*Z*)-1-chloropropene
- Acetone

### **Bunch 2 (Short Essay Type)**

- Comment on the aromaticity of pyrrole and indole on the basis of orbital theory.
- Demonstrate the concept of kinetic and thermo dynamic control in a chemical reaction? explain with suitable example.
- What you mean by chirality? Differentiate between axial, planar and helical chirality.
- Explain the mechanism of esterification of acid by AAL1 mechanism.

(5 x 5 = 25)

### **SECTION C**

Answer **any two** questions. Each question carries 15 marks

- Describe the significance of *Jablonski* diagram and related processes in detail.
  - Depict the principle of photochemistry of vision
- Give a detailed account on various non-covalent interactions.

- b) Define resolution and discuss various methods of resolution with suitable examples.
24. Illustrate the conformational analysis of cyclohexane and derivatives in detail.
25. Write short notes on
- a) Meso compounds
  - b) Curtin-Hammet principle
  - c)  $\alpha$ -haloketone rule
  - d) Barton reaction

(15 x 2 = 30)

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