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Total Pages : 3

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**May 2026**

**B.S.C. (LIFE SCIENCE) II SEMESTER**

**Conceptual Organic Chemistry-II (OSU-130-V)**

Time : 3 Hours]

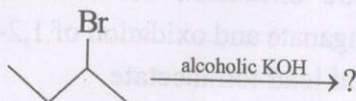
[Maximum Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any **four** questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) Why is the bromination of alkanes more selective than chlorination? (1.5)
- (b) Arrange in increasing order of E2 reactivity: primary, secondary, tertiary. (1.5)
- (c) How does steric hindrance affect SN2 reaction? (1.5)
- (d) Discuss the major product in the following reaction: (1.5)

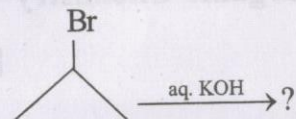


- (e) What is the product when nitro compounds are reduced in acidic medium? (1.5)

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- (f) What is dehalogenation of vicinal dihalides? (1.5)
- (g) Name two reagents for reduction of aldehydes. (1.5)
- (h) Write the factors strongly favours an E2 reaction and why? (1.5)
- (i) Predict the product and mechanism of the following reaction: (1.5)



- (j) State and explain Saytzeffs rule with an example. (1.5)

### PART-B

2. (a) Explain the SN1 and SN2 nucleophilic reactions and their mechanisms in detail. Also discuss the stereochemical outcome of both the reactions when a chiral alkyl halide reacts with a nucleophile? (10)
- (b) Differentiate between Clemmensen and Wolff-Kishner reduction reactions. (5)
3. (a) Explain the Hofmann elimination reaction with mechanism. Why does it give the Hofmann (less substituted) product? (5)
- (b) Describe oxidation of alcohols using potassium permanganate and oxidation of 1,2-diols using periodic acid and lead tetraacetate. (10)
4. Discuss whether E1 or E2 mechanism is favored in the dehydrohalogenation of tert-butyl bromide. Explain the reasons

for its preference. Describe both E1 and E2 mechanisms with suitable examples and discuss the effect of base strength on the reaction. (15)

5. (a) Explain free radical substitution reactions with reference to halogenation of alkanes and allylic compounds. (5)
- (b) Describe the Friedel-Crafts reactions in aromatic compounds. Explain the mechanism of both alkylation and acylation reactions, highlighting their differences and limitations. (10)
6. (a) What are meta-directing groups? Explain the influence of  $-\text{NO}_2$  and  $-\text{NH}_2$  directing groups in case of nitrobenzene and aniline respectively. Also, give their plausible resonance structures. (10)
- (b) Outline the mechanism of nitration and sulphonation of benzene, indicating the generation of electrophile. (5)
7. Explain the following oxidation/ Reduction reactions (15)
- (a) Baeyer Villiger oxidation.
- (b) Oppenauer Oxidation.
- (c) Rosenmund Reduction.
- (d) Iodoform reaction.
- (e) Oxidation using Tollens's reagent.