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**VA—09—2024**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**B.Sc. (First Year) (Second Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

**CHEMISTRY**

**Paper—III**

**(Organic and Inorganic Chemistry)**

**(Monday, 02-12-2024)**

**Time : 10.00 a.m. to 12.00 noon**

*Time—2 Hours*

*Maximum Marks—40*

**N.B.** :— Attempt *all* questions.

1. Solve any *three* of the following : 3×5=15
- (a) Explain the following properties of *p*-block elements :
- (i) Metallic character
- (ii) Melting and boiling points.
- (b) Discuss oxidizing and reducing properties of *p*-block elements.
- (c) Define acids and bases with example according to :
- (i) Cady-Elesy concept
- (ii) Usanovich concept.

P.T.O.

- (d) What is SHAB principle ? Discuss its limitations.
- (e) Define hard, soft and borderline acids and bases with example.

2. Solve any *three* of the following : 3×5=15

(a) State Huckel's rule of aromaticity and antiaromaticity. Discuss aromatic character of :

(1) Benzene

(2) Pyrrole.

(b) Explain Kolbe's reaction of phenol with mechanism.

(c) (1) Discuss Ullmann biaryl synthesis.

(2) Give the following reactions of vinyl chloride :

(i) Action with HBr

(ii) Polymerization.

(d) (1) Give *two* preparation methods for Acetamide.

(2) What is the action of water and nitrous acid on acetamide ?

(e) What are epoxides ? Give their nomenclature. How will you prepare ethylene oxide from :

(i) Ethene and Ag

(ii) Ethene and peracid.

3. Solve any *two* of the following : 2×5=10

- (a) Discuss the effect of –OH group in the nitration of phenol.
- (b) (1) Explain the acidic characters of phenol.  
(2) Discuss the relative reactivity of Alkyl halide *versus* Vinyl halide.
- (c) Explain ring opening reactions of propylene oxide in acidic and basic medium.
- (d) (1) Give *two* methods for the preparation of acetic anhydride.  
(2) What is the action of water, alcohol and amine on acetyl chloride ?