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SA—09—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

MARCH/APRIL, 2025

(New/CBCS Pattern)

CHEMISTRY

Paper–III

(Organic and Inorganic Chemistry)

(Wednesday, 9-4-2025)   **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*)   Electron affinity

        (*ii*)   Electronegativity.

    (*b*)   Explain the variations in acidic and basic characters of hydroxides of *p*-block elements.

P.T.O.

(*c*) Define acids and bases with example according to :

    (*i*) Bronsted–Lowry concept

    (*ii*) Lux–Flood concept.

(*d*) What is Pearson's principle of SHAB ? Discuss its applications.

(*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 Anthracene and Pyridine.

(*b*) Discuss Reimer–Tiemann reaction of phenol with mechanism.

(*c*) (1) Give the synthesis of Allyl iodide from :

    (*i*) Allyl chloride

    (*ii*) Glycerol and HI.

    (2) What is the action of NaOH and KCN on Allyl iodide

(*d*) (1) Give *two* preparation methods for ethyl acetate

    (2) Explain hydrolysis, action of amine and reduction reaction of ethyl acetate.

(*e*) (1) How will you prepare glycerol from :

(*i*) Oils and fats

(*ii*) Propene.

(2) What is the action of the following reagents on glycerol :

(*i*) Nitric acid

(*ii*) Acetyl chloride.

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

(*a*) Explain Friedel Craft's alkylation of benzene with mechanism.

(*b*) Write a note on carboxylation and acylation of phenol

(*c*) How will you synthesize halobenzene by :

(*i*) Hunsdiecker reaction

(*ii*) Gattermann reaction.

(*d*) (1) What is the action of water, alcohol and amine on Acetic anhydride

(2) Explain the ring opening reaction of propylene oxide in basic medium.