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VA—08—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

CHEMISTRY

Paper–VI

(Organic and Inorganic Chemistry)

(Saturday, 30-11-2024) **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours* *Maximum Marks*—40

N.B. *:—* Attempt *all* questions.

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

   (*a*) Explain the brief separation of Zn^{++} and Mn^{++} with necessary chemical reactions.

   (*b*) What is solubility product ? Explain its role in the separation of III A and III B group radicals.

   (*c*) Explain the role of the following organic reagents in qualitative analysis :

      (*i*) 1, 10-phenanthrolin

      (*ii*) α-Benzoinoxime.

P.T.O.

(*d*) Why is water known as universal solvent ? Explain dielectric constant property of solvent.

(*e*) Explain the following reactions in liq.NH_3 :

(*i*) Precipitation

(*ii*) Ammonolysis.

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

(*a*) Explain Benzoin condensation reaction with mechanism.

(*b*) How will you synthesize Anthranilic acid by :

(*i*) Phthalimide

(*ii*) O-Nitro-toluene

(*c*) What are organolithium compounds ? How will you obtain the following from methyllithium :

(*i*) Ethanol

(*ii*) 2-Propanol.

(*d*) Explain Clemmensen reduction reaction with mechanism.

(*e*) How will you synthesize the following from ethyl acetoacetate :

(*i*) Propionic acid

(*ii*) Acetyl acetone.

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

(*a*) (*i*) What is the action of the following on salicylic acid ?

(*a*) Br_2

(*b*) HNO_3.

(*ii*) What is the action of the following on Benzoic acid :

(*a*) $LiAlH_4$

(*b*) Conc. HNO_3 + Conc. H_2SO_4.

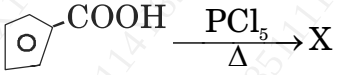
(*b*) Explain saponification value and Iodine value.

(*c*) What are detergents ? Give the classification of detergents.

(*d*) Predict the X in the following reactions :

(*i*) $R - \overset{\overset{O}{\|}}{C} - H + BrCH_2COOC_2H_5 \xrightarrow[(ii)\ H^+]{(i)\ Zn + ether} X$

(*ii*) $CH_3 - CH_2 - CH_2 - COCl \xrightarrow{X} CH_3 - CH_2 - CH_2 - CH_2OH$

(*iii*)  $\xrightarrow[\Delta]{PCl_5} X$

(*iv*) $C = O + X \xrightarrow{\text{dry ether}} CH_3 - \overset{\overset{O}{\|}}{C} - OH$

(*v*) $2CH_3 - \overset{\overset{O}{\|}}{C} - OC_2H_5 \xrightarrow[(ii)\text{dil.HCl}]{(i)\ C_2H_5ONa} X$