This question paper contains **4** printed pages]

GA—17—2023

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2023

(CBCS/New Pattern)

CHEMISTRY

Paper VIII (CCC-IV)

(Organic and Inorganic Chemistry)

(Tuesday, 25-4-2023) **Time : 2.00 p.m. to 4.00 p.m.**

Time— Two Hours *Maximum Marks*—40

N.B. :— Attempt *All* questions.

1. Solve any *three* of the following : 15

   (*a*) What are '*d*' block elements ? Give the electronic configuration of second transition series elements.

   (*b*) Give the applications of the Lanthanides and their compounds.

   (*c*) What is Lanthanide contraction ? Give the consequences of Lanthanide contraction.

   (*d*) Explain catalytic properties of transition elements with suitable examples.

   (*e*) Discuss the similarities and differences between the Lanthanide and actinides series elements.

P.T.O.

2. Solve any *three* of the following : 15

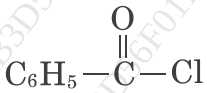
(*a*) What is stereoisomerism ? Give the 'R' and 'S' configuration of the following compounds :

(*i*) Lactic acid

(*ii*) Glyceraldehyde

(*b*) Explain Glucose reacted with phenylhydrazine [Osazone formation] with mechanism.

(*c*) What are aromatic amines ? What is the action of the following on aniline ?

(*i*) 

(*ii*) C_6H_5—CHO

(*iii*) HNO_2 + HCl

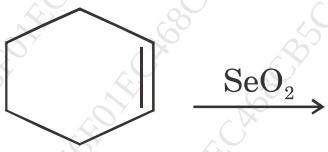
(*iv*) CS_2

(*d*) Explain the following terms with suitable example :

(*i*) Enantiomers

(*ii*) Diastereoisomer

(*e*) Predict the product :

(*i*) 

(*ii*) $CH_3— COOH + CH_2 = CH_2 \xrightarrow{BF_3}$

(*iii*) $CH_2 = CH — CHO \xrightarrow[H_2O]{OSO_4}$

(*iv*) $R\text{-}COOH + R'— OH \xrightarrow{BF_3}$

(*v*) $CH_3 — CH = CH—CH_3 \xrightarrow[H_2]{O_3}$

3. Solve any *two* of the following : 10

(*a*) How will you convert Glucose to Mannose ?

(*b*) Define the following terms :

(*i*) Optical isomerism

(*ii*) Chiral carbon atom

(*iii*) Racemic mixture

(*iv*) Axis of symmetry

(*v*) Centre of symmetry.

(*c*) How will you prepare urea by Wohler's method ? What is the action of the following on urea ?

(*i*) Heat

(*ii*) $SOCl_2$

(*iii*) Acetyl chloride

(*iv*) Nitrous acid

P.T.O.

(*d*) How will you convert :

(*i*) Glucose to Sorbitol;

(*ii*) Glucose to Glucosazone;

(*iii*) Phenol to Aniline;

(*iv*) Nitrobenzene to Aniline.

(*v*) Aniline to Phenyl Isocyanide.