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

NA—12—2023

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2023

(CBCS/New Pattern)

CHEMISTRY

Paper–VIII

(Organic and Inorganic Chemistry)

(Tuesday, 5-12-2023) **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 : 15

   (*a*) Give the Electronic configuration of 3rd transition series elements.

   (*b*) Explain the separation of lanthanide series elements by ion exchange method.

   (*c*) Give comparison between lanthanides and actinides.

   (*d*) Explain the following properties of first transition series element :

      (*i*) Complex formation

      (*ii*) Magnetic properties.

   (*e*) How is uranium extracted from pitchblend by acid digestion method ?

P.T.O.

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

(*a*) What are carbohydrates ? How are they classified ?

(*b*) What is the geometrical isomerism ? Give the E and 2 nomenclature of the following compound :

(*i*) 2-pentene

(*ii*) Meleic acid.

(*c*) What is the action of the following on urea ?

(*i*) Action of heat

(*ii*) Nitrous acid

(*iii*) Thionyl chloride

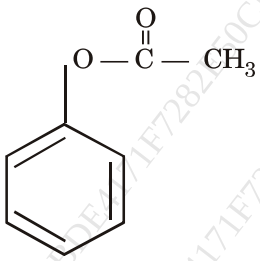
(*iv*) Formaldehyde

(*v*) Acetyl chloride.

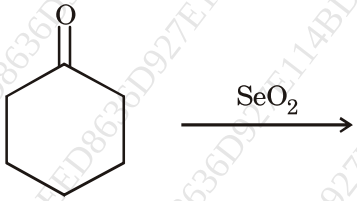
(*d*) Predict the product :

(*i*) $CH_3 - CHO \xrightarrow{SeO_2}$

(*ii*) $CH_2 = CH_2 \xrightarrow{OsO_4}$

(*iii*) 

(*iv*) $R - CH = CH_2 \xrightarrow[H_2O]{O_3}$

(*v*) 

(*e*) What is isomerism ? Explain types of structural isomerism.

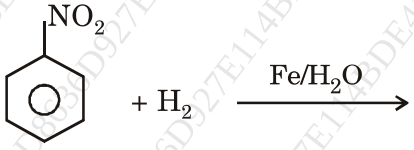
3. Solve any *two* of the following : 10

(*a*) How will you convert fructose to glucose ?

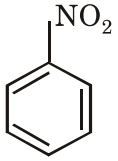
(*b*) Explain element of symmetry in detail.

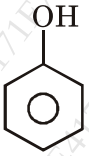
(*c*) What is mutarotation ? Give its mechanism.

(*d*) Predict the product :

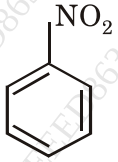
(*i*) 

P.T.O.

(*ii*)  + conc. HNO_3 $\xrightarrow{\text{conc.}H_2SO_4}$

(*iii*) $CH_2 - N_2$ +  $\longrightarrow$

(*iv*) $CH_2 - N_2$ $\xrightarrow{\text{Heat}}$

(*v*)  $\xrightarrow[\text{Reduction}]{\text{Electrolytic}}$ conc.H_2SO_4