

Ex/SC/CHEM/UG/DSE/TH/04/A/2023

**B. Sc. CHEMISTRY EXAMINATION, 2023**

( 6th Semester )

**CHEMISTRY (DSE)**

**PAPER: DSE/CHEM/TH/04**

Time : Two Hours

Full Marks : 40

**UNIT : 6041-I**

1. Answer the following questions:
  - a) Mention the physical and chemical properties of glass. What are the important properties of 'glass wool'? Mention some of its uses. 2+1+1
  - b) Mention the raw materials for the manufacture of cement. 2
  - c) Write a short note on (*any one*) : 3
    - i) Setting of Cement
    - ii) Glazing
  - d) What are ceramics? 1
2. Answer the following questions : 5×2
  - a) Write down the basic reactions involved in the catalysis by organometallic compounds.
  - b) Write down the steps involved in catalytic reaction  $A \rightarrow B$  using a solid porous catalyst.
  - c) Explain the catalytic cycle of hydroformylation of alkene using  $[Co_2(CO)_8]$  as the catalyst.

[ Turn over

[ 2 ]

- d) Explain reactant selectivity and product selectivity during shape selective catalysis.
- e) Write down the mechanistic steps of polymerization of olefin by Ziegler-Natta catalyst.
3. Answer the following questions :
- a) How do chlorofluorocarbons deplete the ozone layer? 2
- b) Of the Arctic region and Antarctic, where does ozone depletion occur most during spring and why? 2
- c) What is Freon 11? 1
- d) What is London type smog? 1
- e) Mention primary and secondary pollutants generated from London type smog. How are they produced from photochemical reactions in the presence of  $\text{NO}_x$  and hydrocarbons? How could we control this type of pollution? 1+2+1
4. Answer the following questions: 5×2
- a) What is biological water pollution? How are coral-polyps formed under the sea water?
- b) What is chelation therapy? Give some examples of chelating ligand for clinical use.
- c) Define electro dialysis process. How does reverse osmosis work to remove salt from ocean water?
- d) What are the precautions to be taken when you come

[ 3 ]

- to know that the real samples are contaminated with  $\text{Cd}^{2+}$ ,  $\text{As}^{3+}$  and  $\text{Hg}^{2+}$  ions?
- e) What is the precise scientific definition of Earthquake? Draw the different tectonic plates of lithosphere.