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**ICH 502**

**III Semester M.Sc. Degree Examination, April/May 2022  
(CBCS)**

**INDUSTRIAL CHEMISTRY  
Industrial Catalysis and Green Chemistry**

Time : 3 Hours

Max. Marks : 70

**Instructions :** 1) Answer Part – A, and any five questions from Part – B.  
2) Figures to the right indicate marks.

PART – A

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1. Answer any five of the following :

(5×2=10)

- What is the purpose of adding amphiphilic reagents in phase transfer catalyst ?
- Write the oxidative addition and reductive elimination reactions involved in acetic acid synthesis by Monsanto process.
- Give the process of sintering process.
- What are factors affecting critical micellar concentration of surfactants ?
- What are promoters and carriers ? Give examples.
- Define the following terms involved in catalysis:
  - Selectivity
  - Temperature response.
- Write the preparation and structure of zeolites.
- What are catalytic poisoning sintering and fouling ?

PART – B

Answer any five questions :

(5×12=60)

- Discuss the preparation and behavior of catalyst.
- Explain the mechanism of polymerization of olefin by Zeigler Natta Catalyst.
- What are the types of adsorption isotherm ? Draw and explain.

(4+4+4)

P.T.O.

PART – B



3. a) Describe the applications of organometallic catalysts.  
b) Give an account for the synthesis of scavenger resins.  
c) Explain the heterogenisation of homogeneous catalysts using polymer supports. **(4+4+4)**
4. a) What are nanophotocatalysis ? Describe the catalysis of gold nano crystals.  
b) Explain the mechanism involved in degradation of dye.  
c) Give a brief note on hydrogen generation by organic synthesis. **(4+4+4)**
5. a) Write a note on the principles of green synthesis.  
b) Discuss briefly about the sonochemical esterification.  
c) What is atom efficiency and write the atom efficiency of Diels Alder reaction. **(4+4+4)**
6. a) Discuss the role of supports, preparation and structure with a suitable example.  
b) Write a brief note on Wacker process.  
c) Describe the catalysis of gold Nano crystals. **(4+4+4)**
7. a) Explain the role of Ag/SiO<sub>2</sub> composite Nano catalysts.  
b) Write the catalyst and oxidation state involved in Wilkinson's catalyst.  
c) Explain the role of ionic liquids in the organic synthesis with a suitable example. **(4+4+4)**
8. a) What are solventless synthesis ? Explain with examples.  
b) Explain the types of sonochemical esterification and coupling reactions.  
c) Describe the advantages and limitations of green synthesis. **(4+4+4)**
9. a) Explain the mechanism of phase transfer catalysis.  
b) Write a note on microwave induced organic synthesis.  
c) Describe the various reactions of active methylene compounds. **(4+4+4)**