2026

Chemistry (Core)

Paper Code : CH-CE-6344

Paper Name : Industrial Chemistry

Time : 2 hours ***Full Marks : 50***

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : 1×4=4

   a) The Electrolysis of aqueous NaCl produces :

   i) Na and Cl_2 ii) H_2, Cl_2 and NaOH

   iii) Na_2O and HCl iii) Only Cl_2

   b) The working principle of a solar cell is based on :

   i) Photoelectric effect ii) Photovoltaic effect

   iii) Thermionic emission iv) Electrolysis

   c) Which fertilizer is suitable for acidic soils ?

   i) Ammonium sulphate ii) Urea

   iii) Calcium ammonium nitrate iv) Superphosphate

   d) Which gas is use to produce ammonia using Nitrogenase enzyme ?

   i) N_2 ii) O_2

   iii) CH_4 iv) CO

2. Answer the following questions : 2×3=6

   a) Mention one industrial use of each of nitrogen and Phosgene ($CoCl_2$).

   b) How is superphosphate prepared ? Give the reaction.

Contd..

c) Name the catalyst used in the preparation of phenol-formaldehyde resin. State one use of this polymer. 1+1=2

3. Answer the following questions ***(any two)*** : 5×2=10

a) Discuss the role of catalysts in the teritary treatment of industrial effluents, giving suitable examples.

b) Describe the complete flow sheet of sulfuric acid manufacture and mention the origin of each input material used.

c) Explain the construction and working of a lithium battery. Highlight its key advantages and limitations. 3+2=5

d) Write the chemical reaction involved in the manufacture of ammonium nitrate and discuss its agricultural importance. 3+2=5

4. Answer the following questions ***(any three)*** : 10×3=30

a) Which types of zeolites are most suitable as cracking catalysts? Discuss the mechanism of hydrocarbon cracking over zeolite catalysts. 4+6=10

b) i) Explain the working of membrane cell and mercury cell processes with neat diagrams. 3+3=6

ii) Explain the anthraquinone process for the manufacture of hydrogen peroxide. Describe the main steps involved with suitable reaction. 4

c) Write the manufacture process of carbon monoxide and acetylene gas. What are the important industrial application of carbon monoxide and acetylene gas ? 4+6=10

d) i) Define elastomers. Give two methods of preparation of synthetic rubber. Why is vulcanization is necessary for rubber? 1+4+1=6

ii) What are the uses of biodegradable polymers ? 2

iii) Give two examples of liquid crystal polymers. 2

e) i) Define biocatalyst ? How does it differ from chemical catalyst? Give examples of bio-catalyzed reactions. 1+2+2=5

ii) Explain the manufacturing process of bleaching powder on an industrial scale. Mention its bleaching action. 3+2=5

f) i) Describe the working principle of a lead acid battery with a neat diagram. 4

ii) Write the chemical reactions taking place in a fuel cell. List the advantages and disadvantages of fuel cells. 2+4=6

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