2024

B.Sc.

Sixth Semester

DISCIPLINE SPECIFIC ELECTIVE – 3

CHEMISTRY

Course Code: CHD 6.11

(Industrial Chemicals & Environment)

Total Mark: 70 *Pass Mark: 28*

Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) What are ferrous and non-ferrous metals? Give examples. 4
   (b) How is silver extracted from Ag_2S by cyanide process? Write the reactions involved. 4
   (c) How is acetylene prepared industrially? Mention its uses and hazards. 2+4=6

2. (a) What is the principle of Bessemer's process? What are the functions of spiegeleisen alloy used in the process? 2+3=5
   (b) Discuss industrial preparation of phosgene. Mention uses and hazards of it. 2+4=6
   (c) Mention three uses of chlorine. 3

UNIT–II

3. (a) Explain the harmful effects of NO_2 on human beings. 4
   (b) Explain the biogeochemical cycle of carbon. 5
   (c) What is biogeochemical smog? Mention its constituents. 1+3=4
   (d) What is sink? 1

4. (a) Explain greenhouse effect. 4
   (b) What are the sources of SO_2 in the atmosphere? Explain its adverse effects with respect to acid rain formation. 2+3=5
   (c) What is ozone hole? 1
   (d) Discuss the effects of air pollution on vegetation. 4

UNIT–III

5. (a) What is hydrological cycle? Explain how it occurs in nature. 1+3=4
   (b) Discuss the nature and source of water pollutants with reference to detergents. 5
   (c) How would you carry out secondary water treatment process? Discuss the activated sludge process. 1+4=5

6. (a) Discuss the pre-concentration method of water pollutants by carbon adsorption and solvent extraction method. 2+2=4
   (b) What are the causes of acidity of water? Explain how to carry out the test. 1+3=4
   (c) Write notes on the following: 3×2=6
      (i) Bacteriological examination of water
      (ii) Causes and test of turbidity in water

UNIT–IV

7. (a) Discuss the following industrial effluents and their treatment options:
      (i) Electroplating 5×2=10
      (ii) Tanning
   (b) With the help of diagram explain the electrodialysis method for the purification of water. 4

8. (a) Discuss the following industrial effluents and their treatment options:
      (i) Fertilizers 5×2=10
      (ii) Petrochemicals
   (b) Give the water quality parameters in ISI for the following: 1×4=4
      (i) pH
      (ii) Dissolved oxygen
      (iii) Total dissolved solids
      (iv) Surfactants

UNIT–V

9. (a) What do you mean by mass defect? Calculate the nuclear energy per nucleon of oxygen atom $_8O^{16}$, which has a mass of 15.994910 a.m.u. (Mass of neutron is 1.008665 a.m.u., mass of proton is 1.007277 a.m.u., mass of electron is 0.0005486 a.m.u.) 1+4=5

(b) What is nuclear fission? Give one example. 3

(c) Write a short note on the following sources of energy: 3×2=6

(i) Natural gas

(ii) Solar energy

10. (a) What do you mean by biocatalysis? Write the advantages of biocatalysis over chemocatalysis. 1+3=4

(b) Explain the disposal of nuclear waste. 4

(c) Write short note on the following sources of energy: 3×2=6

(i) Hydrogen

(ii) Tidal energy