(b) How sulphuric acid is manufactured by contact process ? Give necessary chemical reactions. Describe the health hazards associated with sulphuric acid. How sulphuric acid should be stored ? 3+3+2+2=10

(c) What are the main sources of SO_2 ? Discuss the effects of SO_2 on living organisms and vegetations. Describe the method of estimation of SO_2. 1+3+6=10

(d) What are the characteristics of non-conventional sources of energy ? Describe biomass as energy source. Why biomass is considered as an attractive energy source ? 2+2+6=10

(e) What are industrial effluents ? Explain the effluents treatment technique of leather industry. Describe about the industrial waste management. 2+3+5=10

(f) (i) What is the purest form of iron ? Write all the chemical reactions of smelting of haematite ore in a blast furnace. 1+4=5

(ii) Describe the Bessemer process for the manufacture of steel. 5

3 (Sem–6/CBCS) CHE HE 2

2025

CHEMISTRY

(Honours Elective)

Paper : CHE–HE–6026

(Industrial Chemicals and Environment)

Full Marks : 60

Time : Three hours

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

1. Answer the following questions : 1×7=7

(a) Asphyxiation is caused by the lack of

(i) N_2

(ii) O_2

(iii) NH_3

(iv) CO_2

(b) Eutrophication is caused by the discharge of which of the following

(i) Phosphates

(ii) Nitrates

(iii) Sulphates

(iv) Chlorides

(c) O_3 layer depletion is mainly due to the presence of

(i) O_2

(ii) CO_2

(iii) N_2

(iv) Chlorofluorocarbon

(d) In nitrogen cycle, ammonium ion $\left(NH_4^+\right)$ is converted to nitrites by nitrification caused by bacteria such as _____.

(e) What is BOD ?

(f) Which of the following is a type of non-renewable resource ?

(i) Nuclear energy

(ii) Solar energy

(iii) Geothermal energy

(iv) Hydrogen and fuel cell

(g) What is meant by smelting ?

2. Answer the following questions : 2×4=8

(a) What is particulate matter ? How does PM1 affect our health ?

(b) Write *two* uses of borax.

(c) How is bleaching powder manufactured ? Give the chemical reaction.

(d) Write the differences between calcination and roasting.

3. Answer ***any three*** questions : 5×3=15

(a) Describe nitrogen cycle.

(b) Describe the manufacture of caustic soda by Nelson Diaphragm cell process. Give the necessary chemical reactions.

(c) How is photochemical smog formed ? Describe *any three* remedial measures of photochemical smog. 2+3=5

(d) What is dissolved oxygen (D.O.) ? Describe the process of measurement of DO content in water with necessary chemical reactions. 1+4=5

(e) What is bio-catalyst ? Discuss the advantages of bio-catalysts. 1+4=5

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

(a) What do you mean by depletion of ozone layer ? Write the photochemistry involved in the depletion of ozone layer by oxides of nitrogen, CFC and halogen. 1+3+3+3=10