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6 SEM TDC DSE CHM (CBCS) 2 (H)

2025

(May)

CHEMISTRY

(Discipline Specific Elective)

(For Honours)

Paper : DSE-6.2

(Industrial Chemicals and Environment)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

1. Choose the correct answer from the following : 1×6=6

(a) Which commercially economical by-product is obtained from the refinery catalytic reforming process?

- (i) CH_4
- (ii) Cl_2
- (iii) H_2
- (iv) CO and H_2

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(Turn Over)



(b) Acid rain is caused by

- (i) global warming
- (ii) fossil fuels
- (iii) airborne toxins
- (iv) None of the above

(c) The chemical oxygen demand (COD) measures the

- (i) amount of oxygen required for growth of microorganism in water
- (ii) amount of oxygen that would be removed from water in order to oxidise pollution
- (iii) amount of oxygen required to oxidise the calcium present in waste water
- (iv) None of the above

(d) Zeolite softening process removes

- (i) only temporary hardness of water
- (ii) only permanent hardness of water
- (iii) both temporary and permanent hardness of water
- (iv) None of the above

(e) The purest form of naturally occurring water is

(i) rain water

(ii) river water

(iii) pond water

(iv) well water

(f) Which gas is mainly produced due to incomplete burning of gas?

(i) CO

(ii) CO₂

(iii) NO₂

(iv) SO₂

2. Answer any six questions from the following : 2×6=12

(a) Describe how chlorine is prepared by brine electrolysis?

(b) Write the objectives of sewage treatment.

- (c) What do you mean by water quality parameters?
- (d) Define hydrological cycle.
- (e) Write a note on ion-exchange in water treatment and purification.
- (f) Explain the toxicity of CO.
- (g) Write a note on acid rain.

UNIT—I

3. Answer any *two* questions from the following :

$$3\frac{1}{2} \times 2 = 7$$

- (a) Explain the process of manufacture of sulphuric acid by contact process.
- (b) Write the general formula of bleaching powder. Write two uses and two health effects of bleaching powder.

$$\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} = 3\frac{1}{2}$$

- (c) How is potassium dichromate prepared from chromite ore?

UNIT—II

4. Answer any *one* question from the following : 4

(a) What is concentration of ore? Define the magnetic separation method with example. 1+3=4

(b) What is semiconductor? Write briefly about *p*-type and *n*-type semi conductors. 1+1½+1½=4

UNIT—III

5. Answer any *four* questions from the following : 4×4=16

(a) Define ecosystem. Discuss the components of a pond ecosystem. 2+2=4

(b) Discuss the treatment and disposal of industrial wastes.

(c) Write short notes on any *two* of the following : 2×2=4

(i) Permutit or zeolite process of water purification

(ii) Particulate matter pollution

(iii) Effect of global warming

- (d) What is ozonisation? Write the advantages of using ozonisation in water purification. $1+3=4$
- (e) Define greenhouse effect. Discuss the role of greenhouse effect in global warming. $1+3=4$

UNIT—IV

6. Answer any *one* question from the following : 4

- (a) Define nuclear pollution. Describe the general adverse effects of radioactive pollution. $1+3=4$
- (b) Write short notes on any *two* of the following : $2 \times 2 = 4$
- (i) Damages caused by nuclear wastes
 - (ii) Harnessing of geothermal energy
 - (iii) Renewable energy and its sources

UNIT—V

7. Answer any *one* question from the following : 4

- (a) What is biocatalyst? Give one example of it. Mention two advantages of biocatalysis over chemical catalysis. $1+1+2=4$

(7)

(b) Write short notes on any *two* of the following : 2×2=4

- (i) Biocatalysis—a green process
- (ii) Industrial applications of enzyme-based biocatalysis
- (iii) Biocatalyst engineering

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