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

**2 0 2 4**

( 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 of the following noble gases does not occur in the elemental state in the atmosphere?

(i) Helium

(ii) Neon

(iii) Argon

(iv) Radon

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(b) Which process is used in the production of acetylene?

- (i) Reforming
- (ii) Partial combustion
- (iii) Arc process
- (iv) Regenerative process

(c) What is the health effect of excess fluorine in drinking water?

- (i) Fluorosis
- (ii) Toothache
- (iii) Lung disease
- (iv) Intestinal infection

(d) Driving force of an ecosystem is

- (i) plants
- (ii) producers
- (iii) solar energy
- (iv) biomass

(e) Montreal Protocol is related to

- (i) global warming
- (ii) sustainable development
- (iii) ozone layer depletion
- (iv) food security

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(f) A typical fuel cell converts

- (i) heat energy into chemical energy
- (ii) heat energy into electrical energy
- (iii) chemical energy into electrical energy
- (iv) kinetic energy into heat energy

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

- (a) Explain the effect of ozone in troposphere.
- (b) Write a short note on 'eutrophication'.
- (c) What are the characteristics of potable water?
- (d) What is the role of incineration in safe disposal of sludge?
- (e) Write a short note on 'primary sewage treatment process'.
- (f) Explain the toxicity of carbon monoxide.
- (g) Describe the environmental effects of chlorine gas.

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UNIT—I

3. Answer any two questions from the following :  $3\frac{1}{2}\times 2=7$

(a) What is syngas? How is CO manufactured in industry? Write one use of CO in chemical industry.  $1+2+\frac{1}{2}=3\frac{1}{2}$

(b) What is potash alum and how is it prepared? Mention two important uses of potash alum.  $1+1\frac{1}{2}+1=3\frac{1}{2}$

(c) Explain the industrial preparation of hydrogen by Bosch process.  $3\frac{1}{2}$

UNIT—II

4. Answer any one question from the following : 4

(a) What is smelting in metallurgy? Give one example of it. Write the reactions take place in the zone of reduction in the manufacture of cast iron.  $1+1+2=4$

(b) What is semiconductor? Write briefly about p-type and n-type semiconductors.  $1+1\frac{1}{2}+1\frac{1}{2}=4$

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UNIT—III

5. Answer any four questions from the following :  $4\times 4=16$

(a) Define ecosystem. Discuss the components of any one ecosystem.  $2+2=4$

(b) What is greenhouse effect? Discuss its consequences. 4

(c) Write short notes on any two of the following :  $2\times 2=4$

(i) Ozone layer depletion

(ii) High temperature carbonisation of coal

(iii) Nutrient budget

(d) What are primary and secondary wastewater treatment? Explain with example.  $2+2=4$

(e) What is dechlorination? Explain the methods of dechlorination.  $1+3=4$

UNIT—IV

6. Answer any one question from the following : 4

(a) What is a nuclear reactor? What are the different components of a nuclear reactor and their uses? Explain.  $1+3=4$

(b) Write a note on 'prevention and control of radioactive waste'. 4

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UNIT—V

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

(a) Write short notes on any *two* of the following :  $2 \times 2 = 4$

(i) Non-aqueous biocatalysis

(ii) Industrial applications of whole-cell based biocatalysis

(iii) Biocatalyst immobilization

(b) Define biocatalyst. Mention two important industrial applications of enzyme-based biocatalysis.  $1 + 1\frac{1}{2} + 1\frac{1}{2} = 4$

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