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

2024

(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

(Turn Over)

(2)

- (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

(3)

- (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.

(4)

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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(Continued)

(5)

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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(Turn Over)

(6)

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. $1 + 1\frac{1}{2} + 1\frac{1}{2} = 4$
