

C 80663

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COMBINED FIRST AND SECOND SEMESTER B.TECH. (14 SCHEME) DEGREE EXAMINATION, APRIL

EN 14 104—ENGINEERING CHEMISTRY

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer any eight questions.*

1. What is green chemistry and how is it important ?
2. What roles iron and copper play in Biology ?
3. What are the steps involved in minimisation of hazardous/toxic products ?
4. Write a note on grease as a lubricant.
5. Distinguish between Gross (or higher) and Net (or lower) calorific value of a fuel.
6. Explain single electrode potential.
7. Describe electrochemical series and applications.
8. How is corrosion prevented by cathodic protection ?
9. Explain electrodeposition.
10. Explain BOD and COD and give its significances.

(8 × 5 = 40 marks)

**Part B**

*Answer one full question from each module.*

**Module I**

11. (a) Write notes on any *two* of the synthetic methods used in green Chemistry. (10 marks)
- (b) Write a note on structure and bonding in organometallic compounds. (5 marks)

*Or*

12. (a) Discuss any *four* principles of green Chemistry. (8 marks)
- (b) Write short note on carbonyls of Iron and Nickel. (7 marks)

**Module II**

13. (a) Write short notes on :
  - (i) Solid lubricants.
  - (ii) Flash and Fire point.
  - (iii) Aniline point.
  - (iv) Cloud and Pour point.

(10 marks)

**Turn over**

(b) Distinguish between Addition and Condensation polymerisation.

(5 marks)

Or

14. (a) What are lubricants ? How are they classified ?

(7 marks)

(b) Differentiate Octane number and Cetane number.

(8 marks)

#### Module III

15. (a) Derive Nernst equation for the electrode potential.

(7 marks)

(b) Define fuel cell. Explain the construction and working of  $H_2-O_2$  fuel cell.

(8 marks)

Or

16. (a) Describe the construction of lead-acid battery with the reactions.

(8 marks)

(b) Describe an experiment to determine the electrode potential of an electrode.

(7 marks)

#### Module IV

17. (a) Explain the mechanism of dry corrosion. Explain the role of oxide film in dry corrosion and classify them.

(8 marks)

(b) Mention the essential ingredients of a paint. What are their functions ? Give examples.

(7 marks)

Or

18. (a) 20 mL of std. hard water (containing 15 g  $CaCO_3$ /litre) required 25 mL of EDTA solution for end point 100 mL of water sample required 18 mL EDTA solution while the same water after boiling required 12 mL EDTA solution. Calculate total hardness of water.

(8 marks)

(b) Distinguish between Hard water and Soft water. What is break point chlorination ?

(7 marks)

[4 × 15 = 60 marks]