

**COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, APRIL 2012**

EN 09/PTEN 09 104—ENGINEERING CHEMISTRY—I

Time : Three Hours

Maximum : 70 Marks

Part A*Answer all questions.*

1. Differentiate between Intrinsic and Extrinsic semiconductors.
2. Why buffer is added during titration of hard water against EDTA ?
3. Graphite functions as a lubricant. Why ?
4. Write the redox reactions taking place in the lead acid accumulators.
5. Mention any *two* alternate refrigerants.

(5 × 2 = 10 marks)

Part B*Answer any four questions.*

6. What are liquid crystals ? Mention their applications in displays and thermography.
7. 0.30 g of CaCO₃ was dissolved in HCl and the solution made up to one litre with distilled water. 100ml of this solution required 30 ml of EDTA solution on titration. 100 ml of hard water sample required 55 ml of same EDTA solution on titration. After boiling 100 ml of this water, cooling, filtering and then titration required 10 ml of EDTA solution. Calculate the temporary and permanent hardness of water.
8. Explain the structure relation to properties of polymers.
9. Enumerate the applications of polymers in electrical and electronic industry.
10. Write a short note on buffer solution. Express Henderson equation for calculation of pH.
11. What are the causes and consequences of thermal pollution ?

(4 × 5 = 20 marks)

Part C*Answer section (a) or section (b) of each question.*

12. (a) (i) Explain the process of ultrapure silicon production. (5 marks)
- (ii) With relevant chemical equations, outline the estimation of dissolved oxygen volumetrically. (5 marks)

Or

- (b) Enumerate the various stages involved in the purification of water for domestic use.

Turn over

13. (a) Explain cationic, anionic and free radical mechanism of polymerization.

Or

(b) Discuss in detail the properties of lubricants highlighting their importance.

14. (a) (i) How is EMF of an electrochemical cell determined through Poggendorf's compensation method? (5 marks)

(ii) What is electrochemical series? What are its applications? (5 marks)

Or

(b) Write a descriptive account on Fuel cells and solar cells.

15. (a) (i) What is the mechanism of drying of oil paints? (5 marks)

(ii) Write note on experimental determination of BOD of a polluted water sample. (5 marks)

Or

(b) Describe the effects of air pollution on environment. What are the methods employed to control air pollution?

(4 × 10 = 40 marks)