C 6286 (Pages : 2) Name.....

Reg. No.....

COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, MAY 2010

PTEN/EN 09 104—ENGINEERING CHEMISTRY

(2009 admissions)

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*
Each question carries 2 *marks.*

1. What are semiconductors ? Give an example for n-type semiconductors.
2. What is hardness of water ? How is it expressed ?
3. Give *one* example each for thermoplastic and thermosetting polymers.
4. Define reduction potential and oxidation potential.
5. Define Pilling-Bed Worth rule.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*
Each question carries 5 *marks.*

6. Write about the applications of carbon nanotubes and nanowires.
7. How is hardness of water sample estimated through EDTA titration ?
8. Discuss the mechanism of cationic polymerization.
9. What are synthetic rubbers ? Give the preparation and structure of any *two* synthetic rubbers.
10. The potential of a hydrogen gas electrode in a solution of an acid of unknown strength is 0.29 V at 298 K as measured against normal hydrogen electrode. Calculate the pH of acid solution.
11. Give an account on photochemical smog and ozone depletion.

(4 × 5 = 20 marks)

Part C

Answer Section (a) **or** *Section (b) of each question.*
Each question carries 10 *marks.*

12. (a) Discuss all aspects of electrical conductivity in solids based on band theory.

Or

(b) Bring out the various steps involved in the purification of water for domestic use.

Turn over

13. (a) Explain the structure relation to properties of polymers. Discuss the process and applications of vulcanization.

Or

(b) Explain thin film mechanism of lubrication. Discuss any *four* properties of lubricants.

14. (a) What are fuel cells? Explain the construction and applications of H_2/O_2 fuel cells.

Or

(b) (i) Derive Nernst equation. (5 marks)

(ii) Write a short note on solar cells. (5 marks)

15. (a) Explain the mechanism of wet corrosion. Give details of corrosion protection through sacrificial anodic method and impressed current method.

Or

(b) (i) How are metals protected from corrosion by electroplating ? (5 marks)

(ii) Write a short account on thermal pollution. (5 marks)

[4 × 10 = 40 marks]