

C 15006

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(Pages : 2)

Name.....

Reg. No.....

COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)  
DEGREE EXAMINATION, MAY 2011

EN 09 104/PTEN 09 104—ENGINEERING CHEMISTRY

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.  
Each question carries 2 marks.

1. Differentiate between *n*-type and *p*-type semiconductors.
2. A sample of water contains the following impurities :—

$Mg(HCO_3)_2 = 75 \text{ mg/L}$ ,  $CaCl_2 = 278 \text{ mg/L}$  and  $MgSO_4 = 142 \text{ mg/L}$ .

Calculate the temporary and permanent hardness.

3. Name the monomers of Bakelite.
4. What is an hydrogen electrode? + Eqn.
5. What is direct corrosion?

(5 × 2 = 10 marks)

Part B

Answer any four questions.  
Each question carries 5 marks.

6. Explain the classification and applications of liquid crystals.
7. How is water softened by lime soda process?  $Ca^{2+}$  &  $Mg^{2+}$  removal, with eqn - 3 Marks.  
Cold & Hot - 2.
8. Briefly discuss the applications of polymers in electrical and electronic industry. - 5
9. Derive the expression for EMF in concentration cells.
10. How is pH measured using glass electrode?
11. Discuss differential aeration corrosion with an example. - 1 eq.

(4 × 5 = 20 marks)

Part C

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

12. (a) (i) Write a short note on ultrapure silicon production.  
(ii) Give the BIS specification for drinking water.

Or

- (b) How is hardness of water determined experimentally by EDTA method? 3+4+3 = cal.

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13. (a) With a neat diagram, discuss the demineralization of water using ion exchange method. <sup>-8+2-</sup>  
with regeneration
- (b) Explain the cationic, anionic and free radical mechanisms of polymerization reactions. <sup>3 3 3</sup>
14. (a) (i) Explain the theory of extreme pressure lubrication. (5 marks)
- (ii) Derive the expression for single electrode potential. (5 marks)

Or

- (b) Describe the construction and functioning of lead acid accumulators and Ni-Cd cells. (5+5)
15. (a) Briefly discuss on galvanic series and galvanic corrosion. (3+2)
- Or
- (b) (i) Explain the cause and consequence of photochemical smog. (3+2) (5 marks)
- (ii) What is thermal pollution? What are its effects? Aug 5 (5 marks)

[4 × 10 = 40 marks]

$$E_c = E_c^{\circ} - 0.0591 \text{pH}$$

Colour - 5  
 Turbidity - 1  
 TS - 5-10  
 pH - 6.5-8.5  
 TH - 200  
 Fe - 0.3  
 Al - 0.03  
 Cu - 0.05  
 Mn - 0.1  
 Zn - 5