

**COMBINED FIRST AND SECOND SEMESTER B.TECH
(ENGINEERING) DEGREE EXAMINATION, MAY 2010**
PTEN/EN09 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 the 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 questions carry 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.

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10. The potential of a hydrogen gas electrode in a solution of an acid of unknown strength is 0.29V 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.

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 H₂/O₂ fuel cells.

Or

- (b) i. Derive Nernst equation.
ii. Write short notes on solar cells.

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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?
ii. Write a short account on thermal pollution.

(4 × 10 = 40 marks)

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