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Question Paper Code : 91367

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

First Semester

Civil Engineering

CY 2111/CY 14/080010001 — ENGINEERING CHEMISTRY – I

(Common to all branches except Marine Engineering)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by hardness of water?
2. Why $\text{NH}_3\text{-NH}_4\text{Cl}$ buffer solution is added during determination of hardness of water by EDTA titration?
3. Write the repeating units for PVC and Teflon.
4. What are the important constituents of a composite?
5. Define the term adsorbent and adsorbate giving suitable examples.
6. What is an adsorption isotherm?
7. Distinguish between nuclear fission and nuclear fusion.
8. How Ni-Cd battery is constructed?
9. Name any four solid lubricants.
10. List out the differences between acid and basic refractory.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With necessary diagram, describe the reverse osmosis method for the desalination of brackish water. (8)
- (ii) What is break-point chlorination? Explain showing different zones. What are the advantages of break-point chlorination? (8)

Or

- (b) (i) Describe demineralization process in treatment of water. Mention the advantages of this method. (8)
- (ii) Write a note on calgon conditioning and disinfection. (8)
12. (a) (i) Write the preparation, properties and uses of SBR and butyl rubber. (8)
- (ii) What do you understand by vulcanization of rubber? What are the advantages and disadvantages? (8)

Or

- (b) (i) List the differences between addition and condensation polymerization. (8)
- (ii) Write a note on fiber reinforced polymer composites with suitable examples. (8)
13. (a) (i) Derive Langmuir adsorption isotherm. (8)
- (ii) Discuss the various factors which affect the adsorption of a gas on solid adsorbent? (8)

Or

- (b) (i) Write briefly about the role of ion exchangers in pollution control. (8)
- (ii) Write a note on the role of adsorbents in catalysis. (8)
14. (a) (i) Describe the principle behind the functioning of solar cell. (8)
- (ii) Explain the construction of lead-acid battery. Write the discharging and charging reactions. (8)

Or

- (b) (i) Describe the construction and working of H₂-O₂ fuel cell. What are its applications? (8)
- (ii) Describe the functioning of lithium battery. (8)

15. (a) (i) How are carborundum and silicon carbide manufactured? (8)
(ii) Explain the terms : Cloud and pour points, flash and fire points. (8)

Or

- (b) (i) What do you mean by nano materials? Explain the properties and applications of carbon nanotubes. (8)
(ii) Write a note on the structure of graphite and its uses as solid lubricants. (8)
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