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Question Paper Code : 23405

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

First Semester

Civil Engineering

CY 2111 — ENGINEERING CHEMISTRY — I

(Common to all branches)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define alkalinity in water. How is alkalinity classified?
2. Distinguish between soft water and demineralised water.
3. What is the structural change that occurs in an elastomer during vulcanization?
4. Write the preparation and uses of PVC.
5. Define the term adsorbent and adsorbate giving suitable examples.
6. What is an adsorption isotherm?
7. Write an equation of a nuclear fission reaction.
8. What are fuel cells?
9. Define refractoriness.
10. Differentiate SWNT and MWNT.

PART B — (5 × 16 = 80 marks)

11. (a) (i) How is hardness of water determined by EDTA method? (8)
(ii) Explain with a sketch, the various steps involved in the treatment of water for domestic purpose. (8)

Or

- (b) (i) What is reverse osmosis? How is sea water purified using this technique? (10)
(ii) Write short notes on carbonate and phosphate conditioning methods. (6)
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) Enumerate the factors influencing adsorption of gases on solids. (8)
(ii) Derive an expression for Langmuir adsorption isotherm. What are its limitations? (8)

Or

- (b) (i) Explain the role of Ni catalyst in the hydrogenation of ethylene. What is the role of promoters in catalysis? (8)
(ii) Describe the process of treatment of effluent by activated sludge process. Give any four applications of activated carbon. (8)
14. (a) (i) Explain the construction and working of Hydrogen – oxygen fuel cell. (8)
(ii) Write a brief account on solar cells. (8)

Or

- (b) (i) What are the functions of the following in a nuclear reactor
(1) D_2O
(2) Cadmium steel rods
(3) Molten alloy of Na – K. (8)
(ii) Constitute a Lead – Acid Battery. Discuss its functioning. (8)

15. (a) Explain the following:
- (i) Natural and synthetic abrasives, (8)
 - (ii) Refractories and their properties. (8)

Or

- (b) Write a note on the following:
- (i) Mechanism of lubrication. (8)
 - (ii) Applications of nanomaterials. (8)
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