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Question Paper Code : 10282

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

First Semester

CY 2111/183101/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? How is it classified?
2. What is caustic embrittlement? How can it be avoided?
3. How is polyurethane prepared?
4. What is the role of sulphur in the vulcanization of rubber?
5. What is an adsorption isotherm?
6. Mention any two uses of activated carbon.
7. What are non-conventional energy sources? Give two examples.
8. What are the applications of lithium batteries?
9. What are abrasives? Give two examples for natural abrasives.
10. Under what situations solid lubricants are used?

PART B — (5 × 16 = 80 marks)

11. (a) (i) 50 ml of sample of hard water required 35 ml of 0.01 M EDTA in the titration. 50 ml of the same sample of water after boiling required 12 ml of 0.01 M EDTA. Calculate total and temporary hardness of water. (6)
(ii) What is disinfection? Explain the mechanism of disinfection by chlorination. What are the disadvantages of bleaching powder over other disinfectants? (10)

Or

- (b) (i) Explain the problems associated with the use of hard water in boilers. (8)
- (ii) What is demineralization? Explain the methods of demineralization. (8)
12. (a) (i) Distinguish between addition and condensation polymerizations with one example each. (8)
- (ii) Give the preparation and uses of Lexan. (4)
- (iii) Mention the properties of engineering plastics. (4)
- Or
- (b) (i) What is vulcanization of rubber? List out the changes caused due to the vulcanization of rubber. (8)
- (ii) What are synthetic rubbers? How is butyl rubber prepared? (8)
13. (a) (i) Compare physisorption and chemisorption. (8)
- (ii) Adsorption of gases on solids is greatly influenced by temperature, pressure and nature of the adsorbent and adsorbate. Justify. (8)
- Or
- (b) (i) Describe the role of adsorbents in catalysis with examples. (8)
- (ii) How is the ion exchange adsorption useful in demineralization of water? Explain. (8)
14. (a) (i) Give an account on the different methods by which solar energy can be harnessed? (8)
- (ii) What are the components of a nuclear reactor? Write briefly about each component. (8)
- Or
- (b) (i) What is reversible battery? Describe the construction and working of Lead acid storage battery with reactions occurring during charging and discharging cycles. (8)
- (ii) What are fuel cells? Describe the construction and working of $H_2 - O_2$ fuel cell. (8)
15. (a) (i) What is meant by refractoriness? How is it measured? (6)
- (ii) Write a note on the preparation, properties and uses of fire clay bricks. (6)
- (iii) How is norbide synthesized? Mention its properties and uses. (4)
- Or
- (b) (i) Explain the mechanism of lubrication. (8)
- (ii) What are nanomaterials? Discuss the types of carbon nanotubes and their applications. (8)