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Question Paper Code : 31325

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 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 is Break point chlorination?
2. Mention the salts responsible for temporary and permanent hardness of water.
3. What is Teflon? How is it formed?
4. What is co – polymerization? Give one example.
5. What is adsorption?
6. What is heterogeneous catalysis?
7. Write an equation of a nuclear fission reaction.
8. What are fuel cells?
9. What are refractories? How are they classified?
10. What are solid lubricants? Give one example.

PART B — (5 × 16 = 80 marks)

11. (a) (i) How will you determine hardness of water by EDTA method? Explain. (8)
- (ii) Describe the process of demineralization of water. (8)

Or

- (b) (i) What do you understand by internal conditioning? Explain phosphate and calgon conditioning. (8)
- (ii) With a neat diagram, explain reverse osmosis method of desalination. (8)
12. (a) (i) Explain the mechanism of free radical polymerization. (8)
- (ii) How will you obtain
- (1) Nylon 6 : 6
- (2) Polyurethane. (4 + 4)

Or

- (b) (i) Explain addition and condensation polymerization. Give atleast two examples each. (8)
- (ii) What is Vulcanization? How does vulcanization improve the properties of rubber? Discuss. (8)
13. (a) (i) Derive Langmuir's adsorption isotherm. (8)
- (ii) What are the factors affecting rate of adsorption? (8)

Or

- (b) (i) What are the differences between physisorption and chemisorption? (8)
- (ii) Derive Gibb's adsorption equation. (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) D₂O
- (2) Cadmium steel rods
- (3) Molten alloy of Na – K. (8)
- (ii) Constitute a Lead – Acid Battery. Discuss its functioning. (8)

15. (a) (i) Explain the significance of the following properties exhibited by refractory materials.
- (1) Porosity
 - (2) Dimensional stability
 - (3) Thermal spalling. (8)
- (ii) Discuss the following characteristics of lubricating oils.
- (1) Flash and Fire point
 - (2) Cloud and pour point. (8)

Or

- (b) (i) Write a brief note on the abrasive properties of
- (1) Diamond
 - (2) Silicon carbide
 - (3) Quartz. (8)
- (ii) What are nanomaterials? What are their advantages? Mention the applications of nanotubes. (8)
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