Reg. No. : | | | | | | | | | | | | |

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) 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) (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)