20/6/16 FN

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

Question Paper Code : 51407

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

First Semester

Civil Engineering

CY 2111/CY 14/080010001 – 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. Write the repeating units for PVC and Teflon.

4. What are the important constituents of a composite ?

5. What is an isotherm ? What are its types ?

6. What is an adsorbent ?

7. Write an equation of a nuclear fission reaction.

8. What are fuel cells ?

9. Define viscosity index. How it is determined ?

10. What are the special characteristics of carbon nanotubes ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Describe the methods of internal treatment of boiler water.

(ii) Draw and explain break point chlorination curve.

OR

(b) (i) Explain the following boiler troubles :

(1) Scales and sludges

(2) Caustic embrittlement.

(ii) What is desalination ? Explain one method of desalination in detail.

12. (a) (i) Write the preparation, properties and uses of SBR and butyl rubber.

(ii) What do you understand by vulcanization of rubber ? What are the advantages and disadvantages ?

OR

(b) (i) List the differences between addition and condensation polymerization.

(ii) Write a note on fiber reinforced polymer composites with suitable examples.

13. (a) (i) Derive Langmuir's adsorption isotherm.

(ii) What are the factors affecting rate of adsorption ?

OR

(b) (i) What are the differences between physisorption and chemisorption ?

(ii) Derive Gibb's adsorption equation.

14. (a) (i) What is a nuclear reactor ? Explain the process of power generation using a neat diagram.

(ii) Write a note on lithium batteries.

OR

(b) (i) What are solar cells ? What are the challenges involved in the Conversion of solar energy into useful energy ?

(ii) Explain the mechanism of hydrogen oxygen fuel cell.

15. (a) (i) What are refractories ? How are they classified ? Give essential requirements of good refactory material.

(ii) Write notes on solid lubricants.

OR

(b) (i) With a neat sketch, explain the mechanism of lubrication.

(ii) How are carbon nanotubes prepared ? Deseribe any two methods.