

20/16/116  
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**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 refractory 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 ? Describe any two methods.