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**Question Paper Code : 71698**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Second Semester

Civil Engineering

CY 6251 — ENGINEERING CHEMISTRY — II

(Common to All Branches Except Marine Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why is water softened before using in boiler?
2. What is meant by caustic embrittlement? How it is prevented?
3. Define single electrode potential. Mention the factors affecting it.
4. Bolt and nut made of the same metal is preferred, justify.
5. Define nuclear chain reaction.
6. Alkaline battery is superior to dry cell. Why?
7. What is meant by thermal spalling? How it can be avoided?
8. What is hydrophobic cement?
9. Distinguish between proximate and ultimate analysis.
10. What is CNG? Give its composition.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the following boiler troubles :
  - (1) Sludge and Scale formation (4)
  - (2) Caustic embrittlement. (4)
- (ii) Describe Reverse Osmosis method for desalination of water. (8)
- Or
- (b) (i) What is meant by internal conditioning of water? (8)
- (ii) Explain the demineralization of water by ion exchange process. How are exhausted cation and anion exchange resins regenerated? (8)

12. (a) (i) Derive Nernst equation for electrode potential. Mention its applications. (8)  
(ii) Describe the sacrificial anode and impressed current methods for corrosion control. (8)

Or

- (b) (i) What is electroless plating? Write short note on electroless nickel plating. (8)  
(ii) What are the factors influencing chemical and electrochemical corrosion. (8)
13. (a) (i) Write notes on lithium battery. (8)  
(ii) With a neat sketch explain the functioning of Hydrogen-oxygen fuel cell. (8)

Or

- (b) (i) Explain with a neat diagram the parts and functions of a nuclear reactor. (8)  
(ii) Explain the construction and working of Ni-Cd battery. (8)
14. (a) (i) What are abrasive? Give the preparation and properties of Carborundum and Alundum. (8)  
(ii) Explain setting and hardening of cements with the reactions involved. (8)

Or

- (b) (i) How are alumina and magnesite bricks manufactured? (8)  
(ii) Write the composition, properties and uses of soda and flint glasses. (8)
15. (a) (i) Describe the ultimate analysis of coal. (8)  
(ii) What is bio-diesel? Explain transesterification and advantages of bio-diesel. (8)

Or

- (b) (i) Explain the physico chemical principles involved in the manufacture of water gas. (8)  
(ii) Explain the flue gas analysis by Orsat method with suitable diagram. (8)