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B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2017

SECOND SEMESTER

CY16251 – ENGINEERING CHEMISTRY II

(Common to all branches except MR and BT)

(Regulation 2016)

Q. Code: 795960

Time: Three Hours

Maximum : 100 Marks

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. What is meant by caustic embrittlement?
2. Calgon treatment is superior to other internal treatments. Why?
3. Mention the advantages of electroless plating over electro plating.
4. State any two significances of EMF series.
5. Distinguish between nuclear fusion and fission reactions.
6. List out the advantages of lithium battery.
7. Mention any two types of glass with an example.
8. How will you minimize thermal spalling in a refractory material?
9. What is meant by octane number?
10. Water gas more calorific value than producer gas. Justify your answer.

PART B - (5 X16 = 80 Marks)

11. (a) (i) Describe the zeolite process of water softening. Write its limitations. **(8)**
(ii) Explain the process of desalination of brackish water with a neat diagram. **(8)**
Mention the advantages and limitations of it.
- (OR)**
- (b) (i) Discuss the process of demineralization with a neat diagram. How are the exhausted cation and anion exchange resins regenerated? **(8)**
(ii) Write notes on carbonate, colloidal and phosphate conditioning. **(8)**

12. (a) (i) Derive Nernst equation. Give its applications. (10)
(ii) Calculate the EMF of a Daniel cell at 25 °C, when the concentration of ZnSO₄ and CuSO₄ are 0.001 M and 0.1M respectively. The standard potential of the cell is 1.1 volts. Calculate ΔG , ΔG° and predict the spontaneity of the cell reaction. (6)

(OR)

- (b) (i) How is corrosion controlled by sacrificial anode method? (8)
(ii) Enunciate the constituents of paint and write their functions. (8)
13. (a) (i) Explain the working of a light water nuclear reactor with a neat sketch. (8)
(ii) With a neat sketch enunciate the working of Ni- Cd battery. (8)

(OR)

- (b) (i) Illustrate the working and uses of Lead storage battery. (8)
(ii) With a neat diagram elaborate the working and uses of H₂-O₂ fuel cell. (8)
14. (a) (i) Discuss in detail on the following i) refractoriness and ii) thermal expansion. (8)
(ii) How is portland cement manufactured? (8)

(OR)

- (b) (i) Explain the setting and hardening of cement. (8)
(ii) Write a note on any two natural and synthetic abrasives and their uses. (8)
15. (a) (i) How is coke manufactured by Otto Hoffmann method? (8)
(ii) Write informative notes on i) biodiesel and ii) power alcohol. (8)

(OR)

- (b) (i) How is petrol synthesized by Bergius process? (8)
(ii) Write in detail on the analysis of flue gases by orsat apparatus. (8)