

Reg. No. : 

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**Question Paper Code : CY8151**

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

First Semester

Civil Engineering

CY 8151 - ENGINEERING CHEMISTRY

(Common to All Branches/Except B.E Marine Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

**PART – A (10×2=20 Marks)**

1. What is hardness ? How do you express it ?
2. Mention the requirements of boiler feed water.
3. Write a note on autocatalysis.
4. Express the Freundlich's adsorption isotherm by a plot.
5. State the importance of heat treatment of steel.
6. What are the effects of alloying elements ?
7. What is synthetic petrol ?
8. List the characteristics of metallurgical coke.
9. What is a supercapacitor ?
10. Differentiate primary and secondary batteries.

PART – B (5×16=80 Marks)

11. a) Describe the ion exchange process in detail. Give a neat sketch along with the chemical equations involved in each step. Also indicate how the ion exchangers are recovered. (16)

(OR)

- b) With a neat diagram, explain the principle, process, advantages and limitations of Reverse Osmosis. (16)

12. a) Derive the Langmuir adsorption isotherm. Also explain the mechanism with various cases. (16)

(OR)

- b) What is a catalyst? What are its types? Derive the Michaelis Menten equation. (16)

13. a) Explain the one component water system with a phase diagram. Explain the system using phase rule. (16)

(OR)

- b) Draw the lead silver phase diagram and explain using phase rule. Also explain the Pattinson process. (16)

14. a) Neatly draw a schematic diagram of the Orsat apparatus and explain the steps involved in the flue gas analysis. (16)

(OR)

- b) Distinguish between :

- i) High and low calorific values
- ii) Coal and coke
- iii) Proximate and ultimate analysis. (5+5+6)

15. a) i) Explain the differences between nuclear fission and fusion reactions. (7)

- ii) With a neat diagram, explain the working of a breeder reactor. (9)

(OR)

- b) Explain the working principle involved in the conversion of solar energy and wind energy as useful energy. (16)
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