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Question Paper Code : 20433

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

First Semester

Civil Engineering

CY 8151 – ENGINEERING CHEMISTRY

(Common to: All Branches (Except Marine Engineering))

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Calculate the hardness in terms of CaCO_3 equivalent, for a water sample containing 81mg of $\text{Ca}(\text{HCO}_3)_2$ per litre.
2. What is reverse osmosis?
3. Differentiate between adsorption and absorption.
4. What are the types of catalysis? Give examples.
5. What is meant by carburizing?
6. Define Phase with an example.
7. What is calorific value of a fuel?
8. Mention the disadvantages of sulphur content in coal.
9. What is the role of moderators in nuclear reactor?
10. Classify the type of batteries with an example.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail about the estimation of hardness by EDTA method. (16)
Or

- (b) (i) Explain Zeolite process of water softening with its advantages and disadvantages. (12)
(ii) Describe Calgon conditioning. (4)

12. (a) (i) Differentiate between physical adsorption and chemical adsorption. (12)
(ii) Explain the effect of concentration on adsorption of solutes from solutions. (4)

Or

- (b) (i) Explain Freundlich theory of adsorption. (10)
(ii) Write short notes on application of catalysis. (6)

13. (a) (i) Explain the effect on properties and use of alloying metals with steel. (12)
(ii) Discuss the types of annealing. (4)

Or

- (b) Discuss in detail the phase diagram of one component system with a neat sketch. (16)

14. (a) Explain the ultimate analysis of coal and its significance. (16)

Or

- (b) How is metallurgical coke manufactured? Explain the recovery of by-products. (16)

15. (a) (i) What are solar cells? Explain the construction and working of solar cells with applications. (10)
(ii) Write short notes on wind energy. (6)

Or

- (b) Define battery. Explain in detail about dry cell with its uses. (16)