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**Question Paper Code : 25064**

B.E./B.Tech. DEGREE EXAMINATION, DECEMBER/JANUARY 2019.

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. What are zeolites?
2. Bring out the differences between scale and sludge.
3. Define acid base catalysis with an example.
4. Distinguish between catalyst promoter and catalyst poisoner.
5. Write the mathematical expression of reduced phase rule.
6. What is Pattinson process?
7. Define calorific value of a fuel.
8. Describe the process knocking.
9. What is a moderator?
10. Write the principles of a fuel cell.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What is hard water? Highlight its disadvantages? (8)
(ii) Explain the mechanism of ion exchange process of water treatment. (8)

Or

- (b) (i) Explain the reverse osmosis process and its advantages. (8)
(ii) What are internal treatments? Explain any two of them. (8)
12. (a) (i) Derive and explain the Langmuir adsorption isotherm. (8)
(ii) Write a note on Freundlich adsorption isotherm. (8)

Or

- (b) (i) What is an adsorption isotherm? What are its major types? (8)
(ii) Write down the difference between physisorption and chemisorption. (8)
13. (a) (i) Explain the phase diagram of water in detail. (10)
(ii) Differentiate between hardening and nitriding heat treatment processes. (6)

Or

- (b) (i) Deduce and explain the lead silver phase diagram. (10)
(ii) What are the significance of alloying? (6)
14. (a) (i) How are fuels classified? Give examples for each of them. (6)
(ii) Distinguish between ultimate and proximate analyses. (10)

Or

- (b) (i) Explain the functioning of Orsat's apparatus (8)
(ii) Write about LPG, its uses, advantages and disadvantages. (8)
15. (a) (i) Explain the working of a hydrogen oxygen fuel cell. (8)
(ii) Distinguish between nuclear fission and nuclear fusion. (8)

Or

- (b) (i) Write notes on the working of a breeder reactor. (8)
(ii) Explain the working of a lead acid battery. (8)