Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80103

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Civil Engineering

CY 8151 — ENGINEERING CHEMISTRY

(Common to all Braches (Except Marine Engineering))

(Regulation 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the salts responsible for temporary hardness of water?
2. Mention the indicator used in EDTA titration. What is the end point?
3. Distinguish between physisorption and chemisorption.
4. Why is a reaction speeded up in the presence of a catalyst?
5. Write down any two applications of alloys.
6. What is triple point?
7. Classify fuels.
8. Define ignition temperature.
9. What is a nuclear chain reaction?
10. What is the voltage generated by H_2 - O_2 fuel cell?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Calculate total hardness of the given sample water which contains the following in ppm.

$CaCl_2 = 111; CaSO_4 = 136$; $MgCl_2 = 95$ and $MgCO_3 = 144$. (8)

(ii) How are Sludge and Scale formed? Write briefly about their prevention and disadvantages. (8)

Or

(b) (i) Describe ion exchange process and explain the reactions involved in it. (8)

(ii) Write notes on

(1) Phosphate conditioning,

(2) Sodium aluminate conditioning. (8)

12. (a) (i) Discuss various factors which affect the adsorption of gas on a solid adsorbent. (8)

(ii) Deduce the expression for Langmuir adsorption isotherm. Mention its limitations. (8)

Or

(b) (i) Explain

(1) Catalytic poisoning,

(2) Catalytic promoters. (8)

(ii) Derive Michaelis-Menten equation. (8)

13. (a) (i) Write notes on any two types of heat treatment of steel. (8)

(ii) Mention the composition and uses of

(1) Nichrome,

(2) Stainless steel. (8)

Or

(b) (i) State phase rule and explain the terms involved in it. (8)

(ii) Draw and label the phase diagram of lead-silver system. Explain. (8)

14. (a) (i) How is proximate analysis of coal carried out? Mention its significance. (8)

(ii) Explain

(1) Octane number and

(2) Cetane number. (8)

How can they be improved?

Or

(b) (i) How is the analysis of flue gas done? Explain with a neat diagram. (8)

(ii) What is calorific value? What are its types? Explain. (8)

15. (a) (i) Distinguish between nuclear fission and nuclear fusion. (8)

(ii) Explain the essential parts of a nuclear reactor with the help of a diagram. (8)

Or

(b) (i) Describe the Ni-Cd cell with reactions. (8)

(ii) Construct a lead acid battery and explain. (8)