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Question Paper Code : 60408

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Second Semester

Civil Engineering

CY 2161/CY 24/080010002 — ENGINEERING CHEMISTRY – II

(Common to All Branches)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is reversible cell? Give a suitable example.
2. Write the reduction reaction of a calomel electrode.
3. Mention the types of corrosion.
4. What are organic inhibitors? What will be the reason for the increase in inhibiting power of aliphatic amines in the following given order?
 $\text{NH}_3 < \text{RNH}_2 < \text{R}_2\text{NH} < \text{R}_3\text{N}$.
5. Calculate the calorific value of a fuel sample of coal with the following data :
 - (a) Mass of coal : 0.6 g
 - (b) Water equivalent of calorimeter : 2200 g
 - (c) Specific heat of water : $4.187 \text{ kJ kg}^{-1} \text{ C}^{-1}$
 - (d) Increase in temperature : 6.52°C .
6. Write the mechanism of knock in petrol engines.
7. What is simple eutectic point?
8. What is the composition of brass and bronzer?
9. State Beer Lambert's law.
10. What is a finger print?

PART B — (5 × 16 = 80 marks)

11. (a) Describe in detail about primary standard hydrogen electrode and calomel electrode. (8 + 8)

Or

- (b) Elaborate the determination of pH of a solution using glass and a common silver-silver chloride reference electrode.

12. (a) (i) Discuss the factors associated with the metal which affects the rate of corrosion. (8)
(ii) How are corrosion protection of underground iron pipelines and railway lines carried out? (8)

Or

- (b) (i) State the constituents of an oil paint with examples and explain their functions. (8)
(ii) Explain metallic coating of nickel by
(1) electroplating and
(2) electroless plating. (8)

13. (a) (i) What is proximate analysis? How is it carried out? Mention its significances. (8)
(ii) How the flue gas analysis is carried out? Explain with neat diagram. (8)

Or

- (b) (i) Explain the Otto-Hoffmann's method of production of coke with neat diagram. (8)
(ii) Discuss the properties and preparation of producer gas. (8)

14. (a) (i) State phase rule and explain the terms involved. (8)
(ii) Draw and explain the phase diagram of two component system with an example. (8)

Or

- (b) (i) Write short notes on any four methods of heat treatment of steel. (8)
(ii) Give the composition and uses of the following alloys :
(1) Nichrome
(2) Stainless steel
(3) Brass
(4) Bronze. (8)

15. (a) Discuss the Principle, construction and working mechanism of the UV visible spectroscopy. (16)

Or

- (b) Explain the following :
(i) Estimation of Ni by AAS (8)
(ii) Estimation of Na by flame Photometry. (8)