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Question Paper Code: 11005

B.E./B.Tech. DEGREE EXAMINATION, DECEMBER 2013.

First Semester

Computer Science and Engineering

01UCY105 - APPLIED CHEMISTRY

(Common to EEE, ECE, EIE, ICE and IT branches)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What do you mean by electrolyte concentration cell? Give an example.
2. Calculate the single electrode potential of zinc in 0.02 M ZnSO₄ solution at 25°C.
 $E^\circ_{\text{Zn/Zn}^{2+}} = 0.763 \text{ V}$.
3. Define Grothus-Droper law.
4. What are photoinhibitors? Give examples.
5. Distinguish between dry corrosion and wet corrosion.
6. Mention the requirements of good paint.
7. Compare physisorption and chemisorption.
8. Write down the limitations of Freundlich absorption isotherm.
9. State Beer-Lambert's law.
10. What are chromophores? Give examples.

PART -- B (5 x 16 = 80 Marks)

11. (a) (i) Derive an expression for electrode potential. (8)
(ii) Explain the construction and working principle of glass electrode. How is it used for the determination of pH of unknown solution? (8)

Or

- (b) (i) What is emf series? Bring out its significances. (8)

- (ii) What are potentiometric titrations? Describe the principle and experimental procedure of redox titration. (8)
12. (a) (i) Explain the mechanism of fluorescence and phosphorescence using Jablonski diagram. (8)
- (ii) What is photolithography? Discuss the various steps involved in this technique. (8)

Or

- (b) (i) Describe photosensitization and quenching processes with proper mechanism. (8)
- (ii) Discuss the determination of quantum yield. (8)
13. (a) (i) Explain electrochemical corrosion with suitable mechanism. (8)
- (ii) Describe differential aeration corrosion with suitable examples. (8)

Or

- (b) (i) Discuss the methods used for the protection of buried iron pipe line from corrosion. (8)
- (ii) What do you mean by electro deposition? Explain the principle and process involved in the electro deposition of gold. (8)
14. (a) (i) Derive an expression for Langmuir's adsorption isotherm. (8)
- (ii) Discuss the various types of adsorption isotherms with suitable examples. (8)

Or

- (b) (i) Describe the removal methods of heavy metals from industrial effluent. (8)
- (ii) Explain the role of adsorbents in catalysis. (8)
15. (a) (i) Explain the estimation of iron by UV-Visible spectrophotometer. (8)
- (ii) Explain the estimation of nickel by AAS. (8)

Or

- (b) (i) Describe the estimation of sodium by flame photometry. (8)
- (ii) Discuss the principle and applications of XRD studies. (8)