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

Question Paper Code: 41105

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

First Semester

Computer Science and Engineering

14UCY105 - APPLIED CHEMISTRY

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

(Regulation 2014)

Duration: Threehours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In the electrolysis of $CuSO_4$, $Cu^{2+} + 2e^- \rightarrow$ Cu takes place at

   (a) Cathode (b) Anode
   (c) In electrolytic solution (d) Both anode and cathode

2. Calculate the emf of a concentration cell at 25^oC consisting of two zinc electrodes immersed in a solution of zinc ions of 0.1 M and 0.01 M concentrations.

   (a) 0.0295V (b) 0.295V (c) 295V (d) 0.00295V

3. Grothus-Dropper Law states

   (a) The light which is reflected by a system can bring about a photochemical change
   (b) The light which is absorbed by a system can bring about a photochemical change
   (c) The light which is transmitted by a system can bring about a photochemical change
   (d) The light which is emitted by a system can bring about a photochemical change

4. Which one of the following transmission is fluorescence

   (a) $T_1 \rightarrow S_0$ (b) $T_3 \rightarrow T_1$ (c) $S_1 \rightarrow T_1$ (d) $S_1 \rightarrow S_0$

5. Iron does not rust when exposed to

(a) Dry air (b) Humid air (c) Moist air (d) Water

6. During galvanic corrosion, the more noble metal acts as

(a) Cathode (b) Anode (c) electrolyte (d) separator

7. In the Contact process, arsenic compounds present in traces are

(a) Promoters (b) Catalysts (c) Catalytic poison (d) Enzyme

8. Heavy metals present in the effluents can be removed by

(a) Simple boiling (b) Reflection technique
(c) Absorption technique (d) Adsorption technique

9. Chromospheres are responsible for

(a) Colour of the compound (b) Formation of salt
(c) Loan pair of electrons (d) Hyperchoromic shift

10. Beer –Lambert's Law is

(a) Applied to Suspension (b) For high temperature system
(c) For concentrated solutions (d) For radiation used is monochromatic

PART - B (5 x 2 = 10 Marks)

11. Define standard electrode potential.

12. State Stark Einstein Law.

13. Give two examples each of anodic and cathodic inhibitors.

14. Write any two differences between physisorption and chemisorptions.

15. What are the various types of electronics transitions?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Derive Nernst equation .Write any two applications. (8)

(ii) Explain the following: (i) Irreversible cell. (ii) Calomel electrode. (8)

Or

(b) (i) With schematic curve explain the principle involved in the potentiometric redox titration with suitable example. (8)

(ii) Explain the determination of pH of an aqueous solution using glass electrode. (8)

17. (a) (i) Describe and discuss the Jablonski diagram depicting various photo physical processes. (8)

(ii) What is chemiluminescence? Discuss the mechanism of chemiluminescence in anion-cation reactions. (8)

Or

(b) (i) Write a detailed note on photolithography. (8)

(ii) With a neat Jablonski diagram to explain the mechanism of Fluorescence and phosphorescence. (8)

18. (a) (i) What is cathodic protection? How would you control corrosion by sacrificial anodic method? (8)

(ii) Give an account of the method used in electroless plating of Ni. (8)

Or

(b) (i) Briefly describe the mechanism of electrochemical corrosion. (8)

(ii) Define paint. Explain its constituents and their functions. (8)

19. (a) (i) Discuss the factors which influence adsorption of gases on solids. (8)

(ii) Derive an expression for Langmuir's uni-molecular adsorption isotherm. (8)

Or

(b) (i) Mention the important applications of catalysts. (8)

(ii) Explain the ion exchange adsorption with suitable example. (8)

20. (a) (i) How do you estimate sodium by flame photometry? Explain with neat diagram. (8)

(ii) Explain the principle and working of a UV- visible spectrophotometer with neat sketch. (8)

Or

(b) (i) Mention the applications of XRD. (8)

(ii) What is the principle involved in Atomic absorption spectroscopy? How do you estimate nickel by Atomic absorption spectroscopy. (8)

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