Reg. No. :

Question Paper Code: 41005

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. Anode of galvanic cell is made up of

   (a) *Zn*   (b) *Cu*   (c) *Mg*   (d) *Al*

2. Which of the following is to convert chemical energy into electrical energy

   (a) Electrode   (b) Electrolytic cell
   (c) Electrochemical cell   (d) Voltmeter

3. Printed Circuit Board (PCB) and Microprocessor are fabricated by

   (a) Electroplating   (b) Photolithography
   (c) Adsorption   (d) Galvanisation

4. The substance which initiate a photochemical reaction but itself does not undergo any chemical change is called

   (a) Catalyst   (b) fluorescent   (c) sensitizer   (d) none of the above

5. Which of the following metals could provide cathodic protection to iron: Al, Zn, Cu, Ni?

   (a) Al and Zn   (b) Cu and Ni
   (c) Cu   (d) All of the above

6. Why Iron is corroded faster than aluminium even though iron is placed below aluminium in electrochemical series

    (a) form Non-Porous of Al_2O_3 (b) form Porous of Al_2O_3

    (c) form mixed porous Layer of Al_2O_3 (d) None of the above

7. Freundlich adsorption isotherm relationship is

    (a) $x/m = KP$ (b) $x/m = KP^n$ (c) $x/m = K(P)^{1/n}$ (d) $x/m = K$

8. What is the effect of adsorption with respect to surface area

    (a) Greater the surface area, greater is the adsorption

    (b) Lesser the surface area, greater is the adsorption

    (c) Greater the surface area, lesser is the adsorption

    (d) none of these

9. Chromospheres are responsible for

    (a) Colour of the compound   (b) Formation of salt

    (c) Loan pair of electrons   (d) Hyperchoromic shift

10. Which among the following is used to find the atomic structure of a crystal?

    (a) XRD   (b) UV-Visible

    (c) AAS   (d) Flame photometry

PART - B (5 x 2 = 10 Marks)

11. Electrode potential of zinc is assigned a negative value (0.76v) whereas that of copper a positive value (+0.34v) give reason.

12. Define Grothus-Draper law of photochemistry.

13. Give the importance of Pilling Bedworth rule.

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) What are reference electrodes and describe the construction of Standard Hydrogen Electrode(SHE).   (8)

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(ii) Draw strong acid and strong base conductometric titration curve and explain how variation of conductance helps to find out end point. (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) State and explain the laws of photochemistry in detail. (6)

(ii) How is quantum yield determined experimentally for photochemical reactions? (10)

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) Explain differential aeration corrosion with suitable example. (8)

(ii) What is cathodic protection? Explain the sacrificial anodic and impressed current cathodic protection methods. (8)

Or

(b) (i) State and explain the various factors that influence the rate of corrosion. (8)

(ii) State the constituents of oil paints with examples and their functions. (8)

19. (a) (i) Discuss the factors which influence adsorption of a gas on a solid. (8)

(ii) Discuss the Applications of activated charcoal in pollution abatement of water and air. (8)

Or

(b) (i) Give the main points of Langmuir theory of adsorption and deduce Langmuir adsorption isotherm equation. (8)

(ii) Write briefly about the role of ion exchangers in pollution control. (8)

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20. (a) (i) Discuss the various types of electronic transitions in detail. (8)

(ii) How is nickel estimated by AAS? Explain the principle and instrumentation. (8)

Or

(b) (i) Derive Beer-Lambert's law and mention its limitations. (8)

(ii) With a neat block diagram and explain flame photometry principle and Instrumentation. (8)

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