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**Reg. No. :**

**Question Paper Code: 41005**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

First Semester

14UCY105 – APPLIED CHEMISTRY

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

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | In the electrolysis of CuSO4, Cu2+ +2e-→ Cu takes place at | | | | | | CO1- R | | |
|  | (a) Cathode | | | | (b) Anode | | | | |
|  | (c) In electrolytic solution | | | | (d) Both anode and cathode | | | | |
| 2. | The electrode potential value of ‘SHE’ is \_\_\_\_\_\_\_\_\_ V at all temperatures. | | | | | | CO1- R | | |
|  | (a) 0.3338 | | | (b) 0.2422 | (c) 0 | | (d) 1.1245 | | |
| 3. | Photolithography is also termed as \_\_\_\_\_\_\_\_\_. | | | | | | CO2- R | | |
|  | (a) UV lithography | | | | (b) IR lithography | | | | |
|  | (c) VISIBLE lithography | | | | (d) MICRO lithography | | | | |
| 4. | Which one of the following transmission is fluorescence | | | | | | CO2- R | | |
|  | (a) T1→S0 | | | (b) T3→T1 | (c) S1→T1 | | (d) S1→S0 | | |
| 5. | During galvanic corrosion, the more noble metal acts as | | | | | | CO3- R | | |
|  | (a) Cathode | | | (b) Anode | (c) Electrolyte | | (d) Separator | | |
| 6. | The rusting of iron is catalysed by which one of the following: | | | | | | CO3- R | | |
|  | (a) Fe | | | | (b) O2 | | | | |
|  | (c) Zn | | | | (d) H+ | | | | |
| 7. | What is the name of phenomenon in which both adsorption and absorption takes place? | | | | | | CO4- R | | |
|  | (a) Chemisorptions | | | (b)Physisorption | (c) Desorption | | (d) Sorption | | |
| 8. | In the Contact process, arsenic compounds present in traces are | | | | | | CO4- R | | |
|  | (a) Promoters | | | (b) Catalysts | (c) Catalytic poison | | (d) Enzyme | | |
| 9. | The radiation source of AAS is \_\_\_\_\_\_\_\_\_\_\_. | | | | | | CO5- R | | |
|  | (a) Tungsten lamp | | (b) Hollow cathode lamp | | | (c) Nernst glower | (d) Mercury lamp | | |
| 10. | Chromospheres are responsible for | | | | | | CO5- R | | |
|  | (a) Colour of the compound | | | | (b) Formation of salt | | | | |
|  | (c) Loan pair of electrons | | | | (d) Hyperchoromic shift | | | | |
|  | PART – B (5 x 2= 10Marks) | | | | | | | | |
| 11. | Define standard electrode potential. CO1- U | | | | | | | | |
| 12. | Define Grothus-Draper law of photochemistry. CO2- U | | | | | | | | |
| 13. | Give two examples each of anodic and cathodic inhibitors. CO3- U | | | | | | | | |
| 14. | What is catalytic poisoning? CO4-U | | | | | | | | |
| 15. | What are chromophores? Give some examples. CO5- U | | | | | | | | |
|  | PART – C (5 x 16= 80 Marks) | | | | | | | | |
| 16. | (a) | (i) Derive Nernst equation .Write any two applications. | | | | | | CO1- App | (8) |
|  |  | (ii) Explain the following: (i) Irreversible cell. (ii) Calomel  electrode. | | | | | | CO1- App | (8) |
|  |  | Or | | | | | |  |  |
|  | (b) | (i) Discuss the conductometric titration of a strong acid with  strong base. | | | | | | CO1- U | (8) |
|  |  | (ii) Describe the construction and working of calomel electrode. | | | | | | CO1- U | (8) |
|  |  |  | | | | | |  |  |
| 17. | (a) | Describe and discuss the Jablonski diagram depicting various photo physical processes. | | | | | | CO2- U | (16) |
|  |  | Or | | | | | |  |  |
|  | (b) | What is Jablonski diagram, using which explain the mechanism of fluorescence and phosphorescence? | | | | | | CO2- U | (8) |
|  |  |  | | | | | |  |  |
| 18. | (a) | (i) Briefly describe the mechanism of electrochemical  corrosion. | | | | | | CO-3 U | (8) |
|  |  | (ii) Define paint. Explain its constituents and their functions. | | | | | | CO-3 U | (8) |
|  |  | Or | | | | | |  |  |
|  | (b) | What is a paint? What are the different constituents of a paint? Briefly Explain their functions. | | | | | | CO3- Ana | (16) |
|  |  |  | | | | | |  |  |
| 19. | (a) | (i) Discuss the factors which influence adsorption of gases on  solids. | | | | | | CO4-U | (8) |
|  |  | (ii) Derive an expression for Langmuir’s uni-molecular  adsorption isotherm. | | | | | | CO4-U | (8) |
|  |  | Or | | | | | |  |  |
|  | (b) | Derive Langmuir adsorption isotherm and mention its merits and demerits. | | | | | | CO4- App | (16) |
|  |  |  | | | | | |  |  |
| 20. | (a) | (i) Mention the applications of XRD. | | | | | | CO5-U | (8) |
|  |  | (ii) What is the principle involved in Atomic absorption spectroscopy? How do you estimate nickel by Atomic absorption spectroscopy. | | | | | | CO5-U | (8) |
|  |  | Or | | | | | |  |  |
|  | (b) | Explain the main features of working of UV-visible spectrometer with a neat block diagram. | | | | | | CO5-Ana | (16) |