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Question Paper Code: 41004

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

First Semester

14UCY104 – ENGINEERING CHEMISTRY

(Common to Civil and Mechanical Branches)

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

- Which of the following may be used as initiator in addition polymerization?
(a) Potassium di chromate (b) Potassium sulphate
(c) Benzoyl peroxide (d) Sodium hydroxide
- Polycarbonate is also called as _____
(a) Perlon-U (b) Fluon (c) HDPE (d) Lexan
- Semi-solid lubricant is
(a) Graphite (b) MoS₂ (c) Grease (d) CNT
- The example of solid lubricant is
(a) Grease (b) Vaseline (c) MoS₂ (d) Castor oil
- An example of cathodic inhibitor is
(a) Hydrazine (b) Calcium sulphate
(c) Benzotriazole (d) Calcium carbonate

6. Name the metal in which volume of the oxide is greater than that of metal
- (a) Mg (b) Cr (c) Mo (d) Hg
7. Silica is a good _____
- (a) Adsorbate (b) Adsorbent (c) Catalyst (d) Promoter
8. Adsorption of H₂ gas on Ni is an example of _____
- (a) Physisorption (b) Absorption (c) Chemisorption (d) Zeolite process
9. Which of the following determination is not possible by using UV-visible spectroscopy?
- (a) dissociation constant (b) molecular weight
(c) Equilibrium constant (d) Nuclear spin resonance
10. Atomic structure of the crystal is founded by
- (a) XRD (b) UV spectroscopy
(c) IR spectroscopy (d) Flame photometry

PART - B (5 x 2 = 10 Marks)

11. Differentiate between homo-polymer and copolymer.
12. What are refractories? How are they classified?
13. Mention the advantages of electroless plating over electroplating.
14. What is Freundlich's adsorption isotherm?
15. What are chromopores?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Discuss the preparation, properties and uses of polyethylene. Differentiate between low density polyethylene and high density polyethylene. (8)
- (ii) What is addition polymerization? Discuss the mechanism of free radical polymerization taking the derivative of ethylene as a monomer. (8)

Or

- (b) (i) Explain why natural rubber needs vulcanization. How is it carried out? (8)
- (ii) Write the differences between addition and condensation polymerization reactions with an suitable example for each type. (8)
17. (a) (i) Explain the general method for the manufacture of refractories. (8)
- (ii) Describe the process of setting and hardening of cement. (8)
- Or
- (b) (i) What are solid lubricants? Explain the structure of any one solid lubricant. (8)
- (ii) Discuss the applications of carbon nanotubes in medical field and chemical field. (8)
18. (a) (i) Explain the mechanism for rusting iron on the basis of electrochemical corrosion. (8)
- (ii) What is cathodic protection? How is sacrificial anode method applied for corrosion control. (8)
- Or
- (b) (i) Give an account of any four factors that influence the rate of corrosion. (8)
- (ii) What are the constituents and functions of paint? (8)
19. (a) Discuss Langmuir theory of adsorption and derive the expression for Langmuir monolayer adsorption isotherm. (16)
- Or
- (b) (i) Explain the role of activated carbon in pollution abatement. (10)
- (ii) Discuss the factors that influence the adsorption of solute from solution. (6)
20. (a) (i) Derive the Beer - Lambert's law. Write its limitations. (6)
- (ii) Give a brief account on estimation of nickel by atomic absorption spectroscopy. (10)

Or

(b) (i) Explain the estimation of nickel by atomic absorption spectroscopy. (8)

(ii) Derive Beer-Lambert's law. What are its limitations. (8)
