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Question Paper Code: 41004

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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)

1. Natural rubber is _____ form of polyisoprene

- (a) CiS (b) trans (c) PLA (d) Lexan

2. _____ is thermosetting plastics

- (a) Polyethylene (b) PVC (c) Bakelite (d) Teflon

3. Semi-solid lubricant is

- (a) Graphite (b) MoS₂ (c) Grease (d) CNT

4. _____ is responsible for flash setting of cement

- (a) C₃S (b) C₃A (c) C₂A (d) C₂S

5. A steel screw in a brass marine hardware corrodes, due to

- (a) Galvanic corrosion (b) Differential aeration corrosion
(c) Waterline corrosion (d) Dry corrosion

6. As the acidity increases, the rate of corrosion

- (a) No effect (b) Increases (c) Decrease (d) Remaining the same

7. Silica is a good _____
 (a) Adsorbate (b) Adsorbent (c) Catalyst (d) Promoter
8. In the adsorption of oxalic acid on activated charcoal, the activated charcoal is known as _____
 (a) adsorber (b) adsorbent (c) absorber (d) adsorbate
9. The wave length region of near UV radiation is
 (a) 400nm -750 nm (b) 800nm-7200 nm
 (c) 200nm-400nm (d) 0nm-100nm
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. Compare the properties of raw rubber with vulcanized rubber.
12. What are refractories? How are they classified?
13. Recommend any two methods for avoiding corrosion.
14. What is Freundlich's adsorption isotherm?
15. State Beer- Lamberts law.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Write the free radical mechanism for the synthesis of PVC. (8)
 (ii) Differentiate addition polymerization from condensation polymerization. (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 any four properties of lubricants. (8)
 (ii) Explain hydrodynamic lubrication mechanism. (8)

Or

- (b) (i) Describe the process of manufacture of Portland cement with a schematic diagram. (8)
(ii) Write short notes on “carbon nano tubes”. (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) Explain any four basic constituents and functions of paints. (8)
(ii) Give an account of electroless plating of Ni. (8)

19. (a) (i) Distinguish between physical adsorption and chemical adsorption. (8)
(ii) Derive Langmuir's adsorption isotherm. (8)

Or

- (b) (i) Discuss any four factors which influence the adsorption of gas on solid. (8)
(ii) Distinguish between physical adsorption and chemical adsorption. (8)

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)

