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Question Paper Code: 41104

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

First Semester

Civil Engineering

14UCY104 - ENGINEERING CHEMISTRY

(Common to ALL Branches)

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Buna-S is obtained from _____
 - Butadiene + styrene
 - Adipic acid + hexadiazine
 - Urea + formaldehyde
 - Chloroprene
- A thermoplastic is formed by the phenomenon of _____
 - Chlorination
 - Condensation polymerisation
 - Nitration
 - Chain polymerisation
- Viscosity index is a measure of _____ of the fluid or liquid at definite temperature
 - optical index
 - internal resistance
 - electrical conductivity
 - thermal conductivity
- The most common form of refractory material used in the construction of a small furnace is _____
 - Silica bricks
 - Fire bricks
 - Chrome magnesite bricks
 - Calcium silicate bricks

5. During galvanic corrosion, the more noble metal acts as _____
- (a) Anode (b) Cathode
(c) Anode as well as cathode (d) Corroding metal
6. The rate of corrosion of iron in atmosphere depends upon _____
- (a) The humidity of the atmosphere
(b) The degree of pollution of the atmosphere
(c) The frequency of rainfall
(d) All of these factors
7. The adsorption of solids, from a solution is called _____
- (a) Chemical adsorption (b) Physical adsorption
(c) Positive adsorption (d) Negative adsorption
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. 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. The radiation source of AAS is _____
- (a) tungsten lamp (b) hollow cathode lamp
(c) Nernst glower (d) mercury lamp

PART - B (5 x 2 = 10 Marks)

11. Differentiate between homo-polymer and copolymer.
12. Mention the requisites of good refractory.
13. Bolt and nut are made up of same metal in practice. Why?
14. What is meant by chromatography?
15. What are the types of various electronic transitions involved in organic molecules?

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) What are biodegradable plastics? How they are superior to ordinary plastics? Justify. (8)
- (ii) Why is vulcanization of rubber necessary? Elaborate the process of vulcanization of rubber. (8)
17. (a) (i) Write down the classification of refractories with examples and explain any two different properties of the refractories. (8)
- (ii) Compare the structure of graphite and molybdenum disulphide and their use in lubrication. (8)

Or

- (b) (i) What are nanomaterials? Give the method of preparation and applications of carbon nano tubes. (8)
- (ii) Write down the composition of cement and explain the various chemical reactions involved in the curing of cement. (8)
18. (a) (i) What are the advantages of electroless plating over electroplating? Discuss in detail the electroless plating of nickel. (8)
- (ii) Write short notes on the electrochemical corrosion. (8)

Or

- (b) Elucidate various steps that can to be taken to control corrosion. (16)
19. (a) (i) Elucidate the Langmuir adsorption isotherm from theoretical consideration. (8)
- (ii) Discuss the applications of activated charcoal in pollution abatement of water and air. (8)

Or

- (b) (i) Discuss the various types of adsorption isotherm. (8)

(ii) Explain the method of removal of heavy metals from effluents using the process of adsorption. (8)

20. (a) (i) Explain the various components and the working of UV-visible spectrophotometer. (8)

(ii) Explain the principle and applications of XRD. (8)

Or

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

(ii) Explain briefly the principle, instrumentation and estimation of sodium by flame photometry. (8)
