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Question Paper Code: 31104

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

First Semester

Civil Engineering

01UCY104 - ENGINEERING CHEMISTRY

(Common to Mechanical Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is meant by the term vulcanization of rubber?
2. Write any two characteristics of composites.
3. What are basic refractories?
4. What are the applications of carbon nano tubes in the field of medicine?
5. Define differential aeration corrosion.
6. List out the functions of thinners in a paint.
7. Distinguish between physisorption and chemisorption.
8. What is meant by ion-exchange adsorption?
9. What are auxochromes? Give an example.
10. Mention any two applications of XRD.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Differentiate thermoplastic from thermosetting plastic with an example. (8)
(ii) Describe the methods of preparation, properties and applications of Teflon and Polyurethane. (8)

Or

- (b) (i) What is synthetic rubber? Explain the preparation, properties and uses of SBR. (8)
(ii) Explain addition and condensation polymerization with a suitable example. (8)
12. (a) (i) Write the structure of graphite. Based on this suggest why this can be used as a solid lubricant. (5)
(ii) Explain the mechanism of boundary lubricants. (5)
(iii) Write in detail about setting and hardening of Portland cement. (6)

Or

- (b) (i) What are refractories? Explain the pyrometric cone test and RUL test for the determination of refractoriness and strength of a refractory specimen. (8)
(ii) Explain the manufacture of Portland cement by wet process. (8)
13. (a) (i) Explain the mechanism of oxidation corrosion and nature of the oxide film formed during this process. (8)
(ii) Write briefly on sacrificial anode and impressed current method of controlling corrosion. (8)

Or

- (b) (i) What is electroless plating? Discuss briefly on electroless Ni plating. (8)
(ii) Enumerate the factor which influences the rate of corrosion. (8)
14. (a) (i) Explain the types and characteristics of catalysis. (8)
(ii) Derive Langmuir's theory of adsorption isotherm and discuss its demerits. (8)

Or

- (b) (i) Explain the factors influencing adsorption of gases on solids. (8)
(ii) Describe the removal of heavy metals from effluent by coagulation, sedimentation and filtration technique. (8)
15. (a) (i) State and derive Beer-Lambert's law. Explain its applications. (8)
(ii) Describe the instrumentation and applications of UV-Visible spectroscopy. (8)

Or

- (b) (i) Explain the principle and instrumentation of atomic absorption spectroscopy. (8)
(ii) Describe the estimation of sodium by flame photometry. (8)