

A

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 99951

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

Open elective

Civil Engineering

19UCH951- CORROSION SCIENCE AND ENGINEERING

(Common to CSE, ECE, EEE, EIE, IT, Mechanical, Agri, Bio medical)

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. When a buried pipeline is protected from corrosion by connecting two magnesium block, it is called CO1- R
(a) Impressed voltage protection (b) Sacrificial cathodic protection
(c) Sacrificial anodic protection (d) Any of these
2. Metal at the top of electromotive series is CO1- U
(a) Most stable (b) Least active (c) Most Noble (d) Most Active
3. In order to make the surface brighter and more corrosion resistant the nickel plate is covered by a thin coating of CO2- R
(a) Chromium (b) Zinc (c) Magnesium (d) Copper
4. _____ coatings provide excellent corrosion protection in sea waters CO2- U
(a) Rubber (b) Polymer (c) Nickel (d) None of the above
5. During galvanic corrosion more noble metal act as CO3- R
(a) Anode (b) Cathode
(c) Anode as well as cathode (d) Corroding metal
6. The rusting of iron is catalysed by which one of the following CO3- R
(a) Iron (b) Oxygen (c) Zinc (d) H⁺

7. Which of the following elements added to iron to improve its oxidation resistance CO4- R
- (a) Zinc (b) Magnesium
(c) Chromium and aluminium (d) None of the above
8. Passivity is due to CO4- R
- (a) Higher EMF (b) Lower EMF (c) Oxide film (d) All of the above
9. In acidic environment the electrochemical corrosion occurs with the replacement of H⁺ ions by the metal, CO5- U
- (a) Iron (b) copper (c) Iron and copper (d) None of the above
10. The rusting of iron is catalysed by which one of the following CO5- U
- (a) Iron (b) Oxygen (c) Zinc (d) H⁺

PART – B (5 x 2= 10Marks)

11. A copper equipment should not possess a steel component. Why? CO1- U
12. Mention the conditions of material selection for the offshore industry. CO2- U
13. Define halogen corrosion. CO3- U
14. Define cathodic protection CO4- U
15. What is corrosion? What is rust CO5- U

PART – C (5 x 16= 80Marks)

16. (a) Discuss briefly the various forms of corrosion with suitable examples CO1- U (16)
- Or
- (b) Explain the process of electroplating with suitable example. CO1- U (16)
Mention the uses of electroplating
17. (a) Explain the method of zinc coating by alloying and electrophoretic coatings. CO2- U (16)
- Or
- (b) Discuss briefly the methods of electro painting and powder coatings with suitable example. CO2- U (16)
18. (a) Explain the method of zinc coating by alloying and electrophoretic coatings. CO3- U (16)

Or

- (b) Discuss briefly the methods of electro painting and powder coatings with suitable example. CO3- U (16)
19. (a) Explain briefly about the corrosion and prevention in concrete. CO4- U (16)
Or
(b) Discuss briefly the corrosion damage and protection in marine environment, CO4- U (16)
20. (a) Explain briefly about the corrosion protection management in various industries. CO5- U (16)
Or
(b) Explain in detail the process maintenance procedures under corrosion environments. CO5- U (16)

