A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59951

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

Open elective

Civil Engineering

15UCH951- CORROSION SCIENCE AND ENGINEERING

(Common to CSE, ECE, EEE, EIE, IT, Mechanical)

(Regulation 2015)

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 if 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. Mention the uses of electroplating — CO1- U — (16)

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)