UNIT 3:CORRODION SCIENCE AND METAL FINISHING

1 Mark Questions

1. Corrosion process is an example of _____ **oxidation**
2. Rusting of iron is a process of _____ **oxidation**
3. Evolution of hydrogen during corrosion in _____ medium **Acidic**
4. According to electrochemical theory corrosion is due to _____ **Formation of cathodic and anodic areas, electrical contact between anode and cathode**
5. Corrosion always take place at _____ **Anodic area**
6. Water line corrosion is an example of _____ **Differential aeration corrosion**
7. Pitting corrosion can be explained on the basis of _____ **Differential aeration corrosion**
8. In differential aeration corrosion, the area more accessible to air acts as _____ **Cathode**
9. The type of corrosion occurring in a wire fence is _____ **Differential aeration corrosion**
10. Differential metal corrosion is _____ **Galvanic corrosion**
11. A water tank is filled with water for storage, which portion of the tank gets corroded in the due course of time on exposure to air **at and below the waterline**
12. Corrosion rate will be lowered when _____ **the anodic area is large and cathodic area is small**
13. Alkali and alkaline earth metals form an oxide layer which is _____ **Porous**
14. Rate of corrosion will be more the area _____ **anode smaller and cathode larger**
15. A metal will be easily corroded in _____ medium **more acidic**
16. The metals corrode easily when the oxides are _____ **porous**
17. If the corrosion product formed during corrosion process dissolves in the medium, the rate of corrosion _____ **increases**
18. Insoluble corrosion product formed during corrosion leads to _____ **prevent further corrosion**
19. Galvanizing is a process of coating iron with _____ **Zn**
20. Iron container used for food storage is coated with _____ **Sn**
21. The flux used in galvanizing is _____ **NH4Cl**
22. A metal which is protected by a layer of its own oxide _____ **Al**
23. Give an example of anodic coating **Galvanizing**
24. The process of coating a metal on a base metal is known as _____ **Inorganic coating**
25. Galvanized nuts and bolts is an example of _____ **Anodic coating**
26. Sacrificial anode method for protecting a metal is an example of _____ **Cathodic protection**
27. Technological importance of metal finishing is to impart _____ **Corrosion resistance, solderability, thermal resistance**
28. In electroplating , the overvoltage potential depends on _____ **electrolyte, temperature, current density**
29. The practical decomposition is greater than the theoretical decomposition potential because of _____ **polarization of electrodes**

30. In electroplating, article to be plated is subjected to pickling to remove_____ **grease**
31. Concentration of metal ions in plating bath is reduced by the addition of _____ **complexing agent**
32. Optimum pH range used in electroplating is_____ **between 4 and 8**
33. In chromium plating, anode is_____ **insoluble and inert anodes**
34. In electroplating of chromium the anode used is _____**Cu**
35. The function of complexing agent in the electrolytic bath is to _____ **maintain the metal ion concentration at an optimum level**
36. The conductors and insulators can be plated by _____**electroless plating**
37. Electroless plating process is possible only on _____surface **catalytic surface**
38. Driving force of electroless deposit is _____ **autocatalytic redox reaction**
39. The process in which the metal ions are deposited on catalytically active surface in presence of a reducing agent is _____**Eelectroless plating**
40. The component used to increase the rate of electroless plating is _____**Exaltant**
41. Reducing agent used in electroless plating of copper is _____ Sodium hypophosphite
42. When the metal surface to be plated is irregular, the process employed is ____**electroless plating**
43. Which corrosion control technique is most suitable in case of buried iron pipelines **cathodic protection**
44. Ships sailing in ocean suffer from **Waterline corrosion**
45. At high hydrogen overvoltage, the rate of corrosion _____ **decreases**

Short and Long answer Questions

1. Describe the electrochemical theory of corrosion with iron as an example.
2. Clarify the importance of galvanic series.
3. Elaborate the effect of following factors on rate of corrosion. (a) ratio of anodic to cathodic areas (b) nature of corrosion product (c) nature of metal.
4. Explain the effect of the following factors on the rate of corrosion: (a) pH (b) temperature
5. Illustrate the following types of corrosion with an example: (a) differential metal corrosion (b) differential aeration corrosion
6. Define inorganic coatings.
7. Define metallic coatings. Describe the following processes: (a) galvanisation (b) tinning.
8. Define cathodic protection. Describe the following methods: (a) sacrificial anode (b) impressed current.
9. Define metal finishing and outline the technological importance of metal finishing.
10. Illustrate the significance of polarization, decomposition potential and overvoltage in electroplating.

11. Describe the effect of the following factors on the nature of the electrodeposit: (a) current density (b) metal ion concentration (c) pH (d) temperature (e) throwing power of the plating bath
12. Describe the pre-treatment and electroplating of chromium.
13. Appraise the differences between electro plating and electroless plating.
14. Explain the corrosion of steel screws in contact with Cu plumbing
15. What is differential aeration corrosion, Give example.
16. Explain waterline corrosion with an example
17. Account for the following: a) Rusting of iron nail is faster in saline solution than in water b) part of the nail inside the wood undergoes corrosion easily
18. Explain why iron in contact with Cu corrodes more readily than in contact with Pb
19. What type of corrosion occurs in the following: a) bolt joints and rivets b) buried iron pipelines c) metallic articles completely immersed in water d) window grills
20. Discuss various corrosion control methods
21. What is decomposition potential
22. Explain why chromium coatings are given Cu or Ni undercoats
23. What are the advantages of electroless plating over electroplating
24. What are the components of an electroless plating bath
25. Discuss the electroless plating of Cu
26. Define polarization, decomposition potential and and overvoltage and mention their significance in electroplating.
27. Explain the process of electroplating of chromium for engineering applications
28. Explain the process of electroplating of chromium for decorative purposes
29. Write a note on Galvanization
30. Write a note on the factors that affect rate of corrosion.