List of Questions for Semester End Examination in Engineering Chemistry (VR20)

(in the order of priority)

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1. Explain the principle and process of electrodialysis for desalination of brackish water.
2. Explain the principle and process of reverse osmosis for desalination of brackish water.
3. Draw the phase diagram of water system and explain it in detail.
4. Draw the phase diagram of silver-lead system and explain it in detail.
5. Explain the construction and working of Calomel electrode.
6. How do you determine pH of a given solution using glass electrode?
7. Explain with a diagram, hydrogen evolution corrosion mechanism.
8. Explain oxygen absorption corrosion with necessary equations and diagram.
9. What is cathodic protection? How do you protect large metallic structures using cathodic protection (both sacrificial anode method and impressed current method)?
10. Define anodic protection and explain the protection of metals from corrosion using this method.
11. Define p-doping and explain the mechanism of conduction in p-doped polyacetylene.
12. Define n-doping and explain the mechanism of conduction in n-doped polyacetylene.
13. Define caustic embrittlement. Explain the reasons for it and propose control methods.
14. What are the reasons for boiler corrosion? Explain the ways to control boiler corrosion.
15. Explain construction and working of lithium cobalt oxide battery.
16. What are fuel cells? Explain general working of a fuel cell and discuss construction and working of H_2-O_2 fuel cell.
17. Define electroplating. Discuss the process of electroplating with an example.
18. What is electroless plating? How do you conduct electroless plating of copper on any object?
19. What are the variables determined in proximate analysis of coal? Explain in detail with their significance.
20. How do you conduct elemental analysis of a coal sample in ultimate analysis? Discuss in detail with chemical equations and significance.

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21. Define coagulation. Explain the mechanism of coagulation with equations.

22. What is chlorination? Explain the mechanism of chlorination. Discuss break-point chlorination using a graph.
23. Discuss various reasons for formation of scales and their disadvantages.
24. What are conditioning methods? Explain control of scale formation using conditioning methods.
25. Explain the principle, construction and working of glass electrode.
26. Explain the construction and working of silver-silver chloride electrode.
27. Define galvanic corrosion. Explain with an example. Discuss the significance of galvanic series.
28. What is differential aeration corrosion? Explain with an example.
29. Explain classification of conducting polymers with examples.
30. How do you analyse a sample of a flue gas using Orsat's apparatus? Explain with diagram.

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31. Explain the following processes involved in municipal water treatment: a) sedimentation and b) coagulation.
32. Define and explain the following terms with examples: a) phase b) component and c) degree of freedom d) Phase rule equation and terms e) Reduced phase rule equation
33. Explain any six applications of phase rule.
34. Discuss construction and working of lithium-thionyl chloride battery.
35. Define and explain pitting corrosion with a diagram.
36. Explain the basic reason for corrosion of most of the metals. Discuss the concept of passivity with an example.
37. What are corrosion inhibitors? Explain the mechanism of corrosion inhibition by anodic and cathodic inhibitors.
38. Explain the mechanism of conduction in undoped polyacetylene.
39. Define HCV and LCV and give the relation between them. Numerical problems on relation between HCV and LCV.
40. Numerical problems on calculation of air required for combustion of fuels.
