Assignment 5

1. What is oxidation?
2. Oxidation is an example of dry corrosion: Justify.
3. What is Pilling-Bedworth ratio? What are its significance and limitations in predicting oxidation resistance of a metal?
4. How would partial pressure of O_2 relate to free energy change?
5. Show the triangle of three parameters (free energy, potential and equilibrium constant) and their interrelation.
6. What are advantages of Ellingham diagram?
7. Show the mechanism of oxidation with reference to the migration of ionic species through the oxide layer. How would different defect arise in the oxide layer due to diffusion process?
8. Prove Wagner parabolic rate law from simple first order diffusion.
9. What are Schottky and Frenkel defects?
10. How would ionic structure of FeO decide its oxidation behavior?
11. Show the effect of dopant on the oxidation behavior of p- and n-type oxide.
12. Show the effect of Cr on the oxidation behavior of Fe.
13. What is hot corrosion? How would it differ from oxidation?
14. What is liquid metal embrittlement?
15. What is biologically influenced corrosion?
16. What are different types of corrosion testing?
17. Show fundamental of linear polarization with proper illustration.
18. Show cathodic and anodic polarization on E vs. i and E vs. logi plots side by side and try to relate different components and see the shape of the curves.
19. How would corrosion affect society?
20. Understanding corrosion principle helps in management of corrosion protection, not preventing corrosion completely: justify.