Question Bank (Material Science)

1. What is space lattice and unit cell?
2. Differentiate between edge and screw dislocations.
3. Differentiate between eutectic and pretectic system.
4. Differentiate between normalizing and cyaniding.
5. Explain all types of crystal imperfections in detail. What are the ill effects of imperfections?
6. What is the significance of TTT diagram?
7. Explain yield point phenomenon.
8. What are the constituents of iron and steel?
9. What is fatigue limit and fracture point.
10. Define creep and creep fracture.
11. Explain Time-Temperature Transformation curve and Iron Carbon diagram in detail.
12. Classify various heat treatment processes in detail. What is the effect of heating on the properties of material?
13. What are Ceramics? Write different types of ceramics.
14. Explain the process of Recovery, Recrystallization and Grain Growth in detail.
15. What is failure? What are the methods by which the failure in a material occurs? How it can be prevented.
16. What is the mechanism of corrosion? What are the types of corrosion? How can we prevent corrosion?
17. Explain ceramics and composites in detail.
18. Explain the phenomenon of creep. How creep testing occurs?
19. Define coordination number and Atomic packing Factor.
20. Differentiate between slip and twinning.
21. Define Gibbs Phase rule and lever rule.
22. What is the difference between carburizing and nitriding?
23. Write the characteristics of pearlite and austenite.
24. Define composites with suitable examples.
25. Derive an expression for number of atoms per unit cell and Atomic Packing Factor in case of Simple cubic, BCC, and FCC.
26. Define Baushinger effect with diagram.
27. Define fatigue limit and ultimate strength.
28. Define creep. What is the effect of temperature on creep?
29. What are the ill effects of corrosion?
30. Explain the process of failure by fracture and fatigue. What are the various factors that affect fatigue?
31. What is creep curve? What is the mechanism of creep? Define creep testing and preventive measures against creep.
32. Define plastics, polymers, ceramics and composites in detail.