

ALPHA COLLEGE OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF DIPLOMA MECHANICAL ENGINEERING
Material Science & Metallurgy

ENGINEERING MATERIALS

1. Define material, material science, material engineering.(SUMMER 2013)
2. Define and explain types of bond.
3. State and explain following with there properties,
 - a. Electrovalent bond
 - b. Covalent bond
4. Explain following structure
 - a. Simple cubic
 - b. Body centered
 - c. Face centered
 - d. Hexagonal close packing
5. State and explain all physical properties with unit.
6. State and explain all thermal properties with unit.

PHASE DIAGRAM

7. Explain with neat sketch TTT (time temperature transformation) diagram, need and application of TTT, steps to draw it.
8. Explain need and characteristics of IRON CARBON diagram with neat sketch.
9. Define heat treatment and state its objective.

METALLURGICAL MICROSCOPE

10. Explain metallurgical microscope with neat sketch.(APRIL 2010/MAY 2011)
11. Explain optical principal of microscope with neat figure.(WINTER 2013)
12. State the sequential steps of preparing a micro-specimen. (WINTER 2013/SUMMER 2014/ WINTER 2013/DEC 2011)

ELECTROLYSIS

13. State industrial application of electrolysis. **(WINTER 2013/SUMMER 2014/WINTER 2013)**
14. Explain Briefly Pitting corrosion and Uniform Corrosion. **(WINTER 2014)**
15. Explain surface coating through electrolysis set up. **(WINTER 2013)**
16. Types of Corrosion and Explain any one Corrosion. **(WINTER 2013)**

METALS AND THEIR ALLOYS

17. Draw any five commercial forms of metal and write its IS number and application. **(APRIL 2010/ SUMMER 2013)**
18. Classify the ferrous metal. Explain chemical composition, characteristics and application of Pig Iron. **(APRIL 2010/WINTER 2013)**
19. Explain effect of different alloying elements on properties of steel. **(APRIL 2010/SUMMER 2013/WINTER 2014)**
20. Explain effect of different alloying element on cast iron. **(DEC 2011/SUMMER 2014/WINTER 2014)**
21. What is Stainless Steel. List different types of S.S. Explain chemical composition, properties and application of any one. **(WINTER 2012/SUMMER 2013/MAY 2011)**
22. Explain important properties & application of Aluminum. **(APRIL 2010/ DEC 2011/SUMMER 2014)**
23. Explain chemical composition, properties & application of copper & its alloy. **(MAY 2011/WINTER 2013)**

NON-METALLIC MATERIALS

24. Explain properties & application of plastic. **(APRIL 2010/SUMMER 2013/MAY 2011)**
25. Explain properties & application of Glass. **(APRIL 2010)**
26. What is Adhesives Materials. Explain adhesion process with neat sketch. **(APRIL 2010)**
27. Explain properties, types and application of Insulating material. **(DEC 2011/WINTER 2013)**
28. Define the term “cladding”. State uses of cladded material. **(DEC 2011/ WINTER 2012)**
29. Write the difference between thermoplastic and thermosetting plastics. **(WINTER 2013/MAY 2011)**

FLUID AND POWDER MATERIALS

30. Write short note on Limitations of Powder Metallurgy. **(WINTER 2014)**
31. Write short note on Sintering. **(WINTER 2014)**
32. Explain Cloud Point and Pour Point For Lubricating Oils. **(WINTER 2014)**
33. Define powder metallurgy and explain basic concept and application of powder metallurgy. **(SUMMER 2014/NOV 2006/JAN 2010)**
34. State the types of coating done on various surface. **(APRIL/MAY 2006)**
35. Explain powder metallurgy merits and demerits. **(SUMMER 2014)**