



8. Differentiate between macroscopic and microscopic observations.
9. Mention any four applications of Differential Scanning Calorimetry.
10. Draw a typical DSC curve showing the melting peak.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the different classifications of materials and their relative properties in detail.

Or

- (b) With examples, explain the procedure for selecting a suitable material for a specific application.

12. (a) Explain the procedure for tensile testing and explain the details/properties that can be determined from the test.

Or

- (b) Explain with a neat sketch the different stages in creep curve and the mechanisms in each stage.

13. (a) Explain the working of a pulse echo A-scan ultrasonic test machine to find the defects in a component.

Or

- (b) Explain in detail the various steps involved in liquid penetrant testing with their advantages and limitations.

14. (a) Elucidate the principle and working of Scanning Electron Microscopy with the different operational modes.

Or

- (b) Briefly discuss the types, advantages and limitations of the electrical and magnetic characterization techniques.

15. (a) Discuss the principle and working of Differential Thermal Analysis and its applications.

Or

- (b) Explain the procedure for determining the composition analysis using Inductively Coupled Plasma technique.

PART C — (1 × 15 = 15 marks)

16. (a) Suggest and explain the suitable technique to detect the longitudinal and transverse cracks in a welded component.

Or

- (b) Explain the specimen preparation procedure for Transmission Electron Microscopy studies and the various modes of operation. List the advantages and applications.