Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91077

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Seventh/Nineth Semester

Aeronautical Engineering

OML 751 – TESTING OF MATERIALS

(Common to: Aerospace Engineering/ Automobile Engineering/Civil Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Industrial Engineering/ Industrial Engineering and Management/Instrumentation and control Engineering/Manufacturing Engineering/Marine Engineering/Mechanical Engineering/ Mechanical Engineering (Sandwich)/Mechatronics Engineering/Petrochemical Engineering/Production Engineering/Robotics and Automation/Bio Technology/Chemical Engineering/Chemical and Electrochemical Engineering/Food Technology/Petrochemical Technology/Petroleum Engineering/Pharmaceutical Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the factors to be considered during selection of materials for testing?
2. Why development of testing is necessary?
3. Neatly draw the stress-strain curve for a ductile material.
4. What is the principle involved in fatigue testing?
5. Differentiate between non-destructive testing and destructive testing.
6. State any two applications of creep test.
7. Differentiate between optical and electron microscope.
8. List the various electrical techniques available for material testing.
9. What is the principle of Differential Thermal Analysis?
10. State the principle of X-Ray fluorescence.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the classification of various material testing.

Or

(b) Describe the different testing organizations, its committee and the standards followed.

12. (a) Explain the principle, experimental method, advantages and limitations of Charpy test.

Or

(b) Sketch the various types of fatigue cycles. Describe the methodology followed during fatigue test. How is S-N curve constructed? Explain the significance of endurance limit.

13. (a) Explain the testing procedure for liquid penetrant inspection with suitable sketch.

Or

(b) Briefly explain about the working principle, advantages, limitations and applications of Ultrasonic testing.

14. (a) Discuss the principle, construction, working and applications of scanning electron microscope.

Or

(b) Explain any one of the diffraction and spectroscopic characterization technique with their advantages.

15. (a) Explain differential scanning calorimetry with working principle and write its applications.

Or

(b) Explain the principle and methodology of inductively coupled mass spectrometry used for determining elemental composition.

PART C — (1 × 15 = 15 marks)

16. (a) Compare and contrast Vickers, Brinell and Rockwell hardness tests.

Or

(b) Explain the procedure of electrical and magnetic technique used in industries to characterize materials.

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