

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION (R), DECEMBER 2023**MECHANICAL ENGINEERING****(2020 SCHEME)****Course Code : 20MET411****Course Name: Advanced Methods in Non-destructive Testing****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. Justify the importance of visual inspection in Non-Destructive Testing.
2. Enumerate the properties of a good penetrant.
3. Explain Snell's law of Critical angle.
4. Discuss the applications of laser shearography.
5. Elucidate the principles of neutron radiography.
6. Discuss the concept of real time radiography.
7. Compare linear and sectorial scans in Phased Array Ultrasonic inspection.
8. What are the objectives of Structural Health Monitoring?
9. Distinguish between digital radiography and computed tomography.
10. Discuss the classifications of thermographic non-destructive examination technique.

PART B***(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. Describe the principle of Magnetic Particle Testing. With a neat sketch, explain any two magnetisation techniques used in magnetic particle inspection. (14)

OR

12. Explain Liquid Penetrant Inspection technique with the help of neat sketches. (14)

MODULE II

13. Discuss Ultrasonic Non-Destructive inspection technique. Explain Pulse-echo and transmission techniques with neat figures. (14)

OR

14. Describe Electro-Magnetic Acoustic Transducer (EMAT) and explain its features. (14)

MODULE III

15. Explain the principles of radiographic inspection and discuss the steps involved in film processing. (14)

OR

16. Discuss SWSI, DWSI and DWDI inspection techniques. (14)

MODULE IV

17. What is Phased Array Inspection technique? Sketch and explain any 4 elemental patterns of phased array transducer probes. (14)

OR

18. Describe the theory of time-of-flight diffraction (TOFD) with neat sketches. List any 2 applications of the process. (14)

MODULE V

19. Explain the working principle of Acoustic Emission Non Destructive Testing and discuss the various stages involved in it. (14)

OR

20. Describe the classifications of thermography testing. List any 5 applications of the process. (14)
