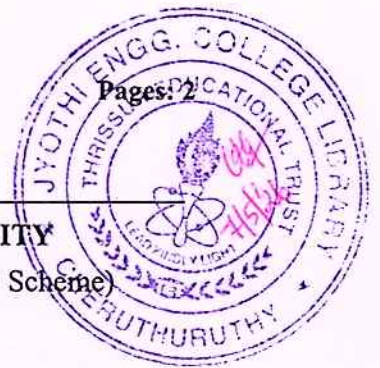


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S, FE) (FT/S5PT) Examinations May 2026 (2019 Scheme)



Course Code: MET413

Course Name: ADVANCED METHODS IN NONDESTRUCTIVE TESTING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|--|-----|
| 1 | Explain any three visual aids used in visual inspection. | (3) |
| 2 | List out the factors affecting Eddy currents. | (3) |
| 3 | Differentiate between Fresnel and Fraunhofer effects. | (3) |
| 4 | What are the advantages of immersion method of ultrasonic testing? | (3) |
| 5 | Name the special units used for radiation measurement. | (3) |
| 6 | Explain any three casting defects that can be identified by radiography. | (3) |
| 7 | Define genetic algorithm. | (3) |
| 8 | Explain the concept of beam steering in phased array inspection. | (3) |
| 9 | Explain the significance of heat sensitive paints during NDT. | (3) |
| 10 | Explain the different types of leaks. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- | | | |
|----|--|-----|
| 11 | a) Describe the steps involved in performing MPI. Compare dry continuous method and wet residual method. | (8) |
| | b) Explain the different steps involved in liquid penetrant testing with neat sketches. | (6) |

OR

- | | | |
|----|---|-----|
| 12 | a) Explain with neat sketches the different coil arrangements used in Eddy current testing. | (8) |
| | b) Compare direct and indirect methods of visual testing. | (6) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Explain the different Ultrasonic testing methods with neat sketches. | (8) |
| | b) Explain the working principle of Laser shearography with neat sketch. | (6) |

OR

- 14 a) Describe the features and applications of Electro Magnetic Acoustic Transducer. (8)
- b) How ultrasonic waves are classified? Explain the different wave forms. (6)

Module III

- 15 a) Explain the different radiographic inspection techniques. (8)
- b) What is real time radiography? Explain its advantages. (6)

OR

- 16 a) Describe in-motion and flash radiography. (8)
- b) Explain the structure of an X-ray film with a neat sketch. (6)

Module IV

- 17 a) Illustrate the principle of Phased Array Ultrasonic Testing (PAUT) system. (8)
- b) Explain the methods of structural health monitoring. (6)

OR

- 18 a) Explain calibration of Time of Flight Diffraction equipment. (8)
- b) Explain the selection of probe angle in TOFD. (6)

Module V

- 19 a) What is computed tomography? Explain imaging techniques in computed tomography. (8)
- b) Explain any two methods of thermography testing. (6)

OR

- 20 a) Explain signal processing and instrumentation in acoustic emission inspection. (8)
- b) Explain Helium mass spectrometer leak testing with a neat sketch. (6)
