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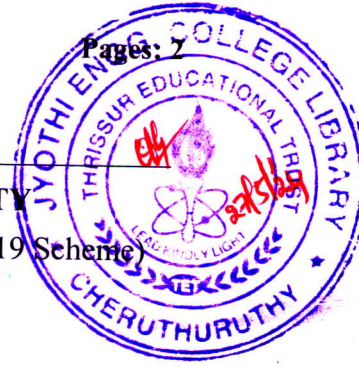
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2024 (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 What are the factors considered while selecting a particular penetrant material for a specific liquid penetrant inspection? (3)
- 2 Name the different types of coil arrangement used in eddy current testing? Explain? (3)
- 3 What are the different modes of wave propagation? (3)
- 4 What are the different types of Ultrasonic search units? (3)
- 5 Explain the difference between double wall double image and double wall super imposing techniques used in RT? (3)
- 6 Give any three applications of flash radiography? (3)
- 7 What are the criteria to select probe angle in TOFD? (3)
- 8 Explain the concept of beam steering in phased array technique? (3)
- 9 Explain the importance of thermally quenched phosphors liquid crystals in thermography? (3)
- 10 Explain the operating principle of Helium mass spectrometer used for leak testing? (3)

PART B

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

Module I

- 11 a) Explain the different steps involved in liquid penetrant testing with neat sketches? (7)
- b) Explain the theory of magnetism? Differentiate ferromagnetic and paramagnetic materials with example? (7)

OR

- 12 a) Explain how eddy current principle is applied in non-destructive evaluation with neat sketch? (7)
- b) What is visual perception? Explain different methods of visual inspection? Explain the importance of lighting in visual inspection? (7)

Module II

- 13 a) Explain how EMAT is different from ultrasonic testing with neat sketch? (7)
b) Explain the basics of ultrasonic guided waves? Compare ultrasonic guided waves with conventional UT? (7)

OR

- 14 a) Explain the working principle of resonance testing method? Give the advantages of resonance testing method? (7)
b) Explain the working principle of Laser shearography with neat sketch? (7)

Module III

- 15 a) Explain the working of in-motion radiographic technique with neat sketch? (7)
b) What is H & D curve? Discuss its importance in radiographic film processing? (7)

OR

- 16 a) What are the different types of industrial radiographic film? explain? (7)
b) Explain the working principle of neutron radiography with neat sketch? Explain its advantages over conventional radiography? (7)

Module IV

- 17 a) Explain the working principle of Synthetic Aperture Focusing(SAFT)technique with neat sketch? (7)
b) Explain the working principle of TOFD with neat sketch? (7)

OR

- 18 a) What are the different types of phased array probes? Explain the characteristics of phased array probes? (7)
b) Explain the working principle of phased array testing technique with neat sketch? (7)

Module V

- 19 a) Explain the theory and working principle of Acoustic emission inspection with neat sketch? (7)
b) What is Leak testing? What are the units used for the measurement of Leak? (7)

OR

- 20 a) Compare active and passive thermographic testing techniques? Explain any two methods of contact thermographic testing technique? (7)
b) Explain the working principle of industrial computed tomography with neat sketch? How it is different from computed tomography? (7)
