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Pages: 2

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (R,S) (FT/WP) (S5 PT) Examination November 2025 (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 the use of field indicators in magnetic particle inspection | (3) |
| 2 | Explain Eddy current testing | (3) |
| 3 | What is Snell's law of critical angle? | (3) |
| 4 | What are the applications of ultrasonic testing? | (3) |
| 5 | Explain the principle of radiography | (3) |
| 6 | What are the advantages of radiographic testing | (3) |
| 7 | Describe the selection of probe angle in time of flight diffraction technique | (3) |
| 8 | What is focal law in the context of phased array ultrasonic testing? | (3) |
| 9 | Differentiate between computed radiography and direct radiography | (3) |
| 10 | Describe the principle of heat sensitive papers | (3) |

PART B

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

Module I

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|----|---|-----|
| 11 | a) Explain any seven instruments used for visual inspection | (7) |
| | b) Explain the principle of magnetic particle inspection | (7) |

OR

- | | | |
|----|---|-----|
| 12 | a) With neat sketches, explain liquid penetrant testing | (8) |
| | b) What are the advantages and limitations of liquid penetrant test | (6) |

Module II

- | | | |
|----|--|------|
| 13 | With a neat sketch, explain the immersion technique used in ultrasonic testing | (14) |
|----|--|------|

OR

- | | | |
|----|--|-----|
| 14 | a) Describe the principle of electromagnetic acoustic transducer | (7) |
| | b) Explain the concept of laser ultrasonics | (7) |

Module III

- 15 a) Explain the principle of neutron radiography (6)
b) With sketches, explain double wall radiography (8)

OR

- 16 a) With a neat sketch, explain in-motion radiography testing (8)
b) Describe about image quality indicators in radiography testing (6)

Module IV

- 17 a) Explain synthetic aperture focusing technique (7)
b) What are the applications of structural health monitoring? (7)

OR

- 18 a) Explain the principle of phased array ultrasonic testing (7)
b) Describe the importance of data acquisition time in Time of flight diffraction systems (7)

Module V

- 19 a) Explain the advantages of digital radiography (7)
b) Describe the principle of computed tomography (7)

OR

- 20 a) What is acoustic emission inspection? (8)
b) What are the applications of infrared imaging? (6)
