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)

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