Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) (FT/WP/S4PT) Examinations April 2026 (2019 Scheme)

Course Code: MET312

Course Name: NON DESTRUCTIVE TESTING

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		Name any three NDT methods and its applications.	(3)
2		Explain the principle of Visual Inspection?	(3)
3		What are the desirable properties of an effective developer in Liquid Penetrant Inspection (LPI)?	(3)
4		List out the steps involved in liquid penetrant inspection in its sequential order.	(3)
5		What is the fundamental principle underlying Magnetic Particle Test?	(3)
6		Why is demagnetization of component after Magnetic Particle Inspection (MPI) considered important?	(3)
7		What are the different ultrasonic waves based on the particle displacement?	(3)
8		What is ultrasonic attenuation?	(3)
9		What are the different types of films used in industrial radiography?	(3)
10		What is the edge effect in Eddy current testing?	(3)

PART B

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

Module I

11	a)	What are the main differences between NDT and DT? Explain why both methods are important in ensuring product quality?	(8)
	b)	What are the differences between direct and indirect methods in Visual Testing, and what types of defects are typically detectable using each method?	(6)

OR

12	a)	Describe the visual inspection procedure and discuss any two types of optical aids using in visual inspection.	(8)
	b)	What are the commonly followed special lighting methods in visual inspection testing?	(6)

Module II

13	a)	What are the advantages and limitations of Liquid Penetrant Inspection methods?	(8)
	b)	What are the different types of penetrant employed in Liquid Penetrant examination?	(6)

And how are they applied for enhanced indication visibility?

OR

14 a) Describe the working principle of Liquid Penetrant Inspection (LPI) and detail the steps involved in the process, supported by clear sketches (8)

b) How is the interpretation and evaluation of test results carried out in dye penetrant inspection? (6)

Module III

15 a) Describe any three methods of direct magnetization used in Magnetic Particle Inspection with the help of neat diagrams? (8)

b) What are the advantages and limitations of Magnetic Particle Inspection (MPI) as a non-destructive testing (NDT) technique? (6)

OR

16 a) Elaborate on the fluorescent magnetic particle testing method and clarify how it enhances inspection in Magnetic Particle Inspection (MPI)? (6)

b) What are the differences between the dry continuous, dry residual, wet continuous, and wet residual techniques in magnetic particle inspection (MPI)? (8)

Module IV

17 a) Explain any three types of ultrasonic transducers with the assistance of clear sketches? (8)

b) Discuss the study of A-scan, B-scan, and C-scan presentations in ultrasonic testing (6)

OR

18 a) What are the differences between contact testing and immersion testing in ultrasonic testing (UT), use figures to justify your points? (8)

b) Explain the through transmission technique and pulse-echo testing technique in ultrasonic testing? (6)

Module V

19 a) Explain radiographic inspection techniques including SWSI, DWSI, and DWDI? (6)

b) What are the arrangement and working principles of real-time radiography? (8)

OR

20 a) What are the common applications of eddy current testing? (6)

b) How are eddy currents generated and how do changes in test frequency and lift-off affect the eddy current response? (8)

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