Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S,FE) (FT/WP) (S4 PT) Examination December 2025 (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	Explain role of NDT in material characterization	(3)
2	Differentiate direct and indirect methods of visual inspection	(3)
3	Why viscosity is treated as one of the important property of liquid penetrant? List any other two properties required by penetrant	(3)
4	Define the terms dwell time and development time?	(3)
5	What is sensitivity in MPI ?	(3)
6	Explain Permeability, Magnetizing force and Coercive force	(3)
7	Describe importance of probe frequency in UT	(3)
8	Write any three advantages of Immersion testing method over Contact testing method in UT	(3)
9	What are the properties of X rays and gamma rays?	(3)
10	Differentiate between low speed films and high speed films	(3)

PART B

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

Module I

11	a)	List the Defects that can be detected by unaided Visual Inspection ? Describe types of mirrors, magnifiers used in Visual Inspection	(7)
	b)	Describe how Environmental factors influence visual inspection	(7)

OR

12	a)	Explain Computer Enhanced Visual system for Visual inspection	(7)
	b)	What is a Fibro scope? Elucidate applications of fibro scope in Visual inspection.	(7)

Module II

13	a)	How are penetrants classified based on a. Physical properties b. Removal techniques c. Strength of indicatioons	(8)

b) Describe the advantages and limitations of LPI (6)

OR

14 a) Explain how the liquid penetrant test be used to detect surface discontinuities? Explain the various stages of liquid penetrant testing procedure. (8)

b) "A good developer should have good absorption characteristics" Do you agree with this statement ? Explain important characteristics of developer used in LPI (6)

Module III

15 a) What are the various reasons for false indications, Non-relevant indications and Relevant indications during MPI? (6)

b) With neat sketches explain the working of coil shot and head shot techniques used in MPI (8)

OR

16 a) Is it essential to demagnetise the specimen before and after the magnetic particle testing? Substantiate your answer (6)

b) What do you meant by residual method of MPI ? Differentiate between dry residual and wet residual methods (8)

Module IV

17 a) Explain the principle and applications of TOFD (8)

b) What are the characteristics of ultrasonic waves (6)

OR

18 a) Explain the modes of presentation of Data in UT (8)

b) Why a coupling medium is required for performing UT ? List out the advantages and limitations of UT (6)

Module V

19 a) Describe the Impedance response of magnetic and Non- Magnetic materials (6)

b) What makes real-time radiography (RTR) better than traditional radiography in recent times? Describe how RTR operates. (8)

OR

20 a) Explain SWSI, DWSI and DWDI inspection techniques in radiographic testing (8)

b) Explain in detail working of Surface Probe, Inside diameter probe and Outside diameter probe (6)

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