Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination December 2022 (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 about different types of visual inspection	(3)
2		List the advantages and disadvantages of magnetic particle inspection technique	(3)
3		Explain about ultrasonic guided waves	(3)
4		What is Snell's law of critical angle?	(3)
5		What are the different types of screens used in radiography inspection	(3)
6		Explain about different types of radiation detectors used during radiography inspection	(3)
7		Explain the significance of wedges used during phased array inspection	(3)
8		Write short notes about beam steering of ultrasound waves	(3)
9		Explain the significance of heat sensitive paints during NDT	(3)
10		Write short notes about the significance of thermo mechanical behaviour of materials during thermo graphic evaluation	(3)

PART B

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

Module I

11	a)	With neat sketches explain the working of liquid penetration inspection technique	(8)
	b)	With the help of simple figure, explain the standard depth of penetration during eddy current testing	(6)

OR

12	a)	With neat figures, explain any two types of magnetisation techniques used during magnetic particle inspection	(8)
	b)	Explain the process of coating thickness measurement by employing eddy current testing technique	(6)

Module II

13	a)	With neat sketches, explain the different types of ultra-sonic testing techniques	(8)
	b)	Explain the working of laser shearography	(6)

OR

14	a)	Differentiate between Fresnel and Fraunhofer effects	(8)
	b)	With the help of a neat diagram, detail about the generation of ultrasonic waves	(6)

Module III

15	a)	Explain about different types of inspection techniques employed during radiography testing	(8)
	b)	What are the parameters based on which the radiography image quality is defined	(6)

OR

16	a)	What is real time radiography? List the merits of the process	(8)
	b)	With neat sketches, differentiate between neutron radiography and motion radiography	(6)

Module IV

17	a)	Explain the working of phased array inspection technique	(8)
	b)	Explain the theory and significance of time-of-flight diffraction	(6)

OR

18	a)	Explain the synthetic aperture focusing technique	(8)
	b)	What is the significance of probe angle during phased array inspection	(6)

Module V

19	a)	With diagram, explain acoustic emission testing technique	(8)
	b)	Explain any two types of leak testing technique	(6)

OR

20	a)	Explain the different types of thermo graphic NDT techniques	(8)
	b)	Differentiate between digital radiography and computed tomography	(6)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2023 (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 principle of magnetic particle inspection?	(3)
2		What are the properties required for a good penetrant?	(3)
3		Explain Snell's Law?	(3)
4		Explain piezoelectric effect? Give any two examples of piezoelectric material?	(3)
5		What are the radiation sources used in RT?	(3)
6		Name the special units used for radiation quantities?	(3)
7		State the theory of TOFD?	(3)
8		List any three phased array probes?	(3)
9		What do you understand by "digitisation of X ray films"?	(3)
10		Explain the concept of leak testing?	(3)

PART B

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

Module I

11	a)	What is penetrant? Explain different types of penetrants?	(7)
	b)	With neat sketch, explain any two magnetisation techniques used in magnetic particle inspection?	(7)

OR

12	a)	Explain various methods of liquid penetrant inspection?	(7)
	b)	With neat sketch explain the working principle of eddy current testing?	(7)

Module II

13	a)	Explain the Ultrasonic testing techniques with neat sketches?	(7)
	b)	Explain the types of Transducers used in Ultrasound testing?	(7)

OR

14	a)	Explain the working principle of EMAT with neat sketch?	(7)

	b)	Explain the working principle of ultrasonic guided waves? List any two advantages of ultrasonic guided wave method?	(7)

Module III

15	a)	Explain radio graphic inspection techniques?	(8)
	b)	What is sensitometry? Discuss the importance of characteristic curves?	(6)

OR

16	a)	Explain the working principle and application of flash radiography?	(7)
	b)	Explain the working principle and application of Fluoroscopy?	(7)

Module IV

17	a)	Explain the working principle of Phased array technique?	(6)
	b)	Explain the calibration procedure in TOFD?	(8)

OR

18	a)	Explain the principle and application of structural health monitoring?	(6)
	b)	How do we interpret defects in TOFD technique. Explain?	(8)

Module V

19	a)	Explain any four types of leak testing?	(8)
	b)	Compare film, CR and DR methods?	(6)

OR

20	a)	Name the classification of thermographic testing? Explain any two methods of thermographic testing?	(8)
	b)	Explain the working principle of Acoustic emission inspection?	(6)

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