

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fifth Semester**Mechanical Engineering***CME354 - Failure Analysis and NDT Techniques***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	State the need of failure analysis in engineering practice.	L2	1	2
2.	Identify any two typical causes of deficient design.	L2	1	2
3.	Name the defects which can be detected by unaided visual inspection.	L1	2	2
4.	Specify the standards that govern liquid penetrant flaw detection.	L1	2	2
5.	List the instruments used to measure the effectiveness of the demagnetizing sequence.	L1	3	2
6.	Outline the factors consider for selection of probes in eddy current testing.	L2	3	2
7.	Define intensifying screens.	L1	4	2
8.	Distinguish between A-scan and C-scan representation in ultrasonic inspection.	L2	4	2
9.	What is Kaiser effect in acoustic waves?	L1	5	2
10.	Mention the ASTM-E standards used for acoustic emission testing.	L1	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Discuss the fundamental sources of failures with examples.	L2	1	10
	ii Illustrate the use of a tree diagram for identifying failure causes.	L2	1	6
	Or			
	b Explain the procedure for performing FMEA and illustrate each step with examples.	L2	1	16
12.	a i Describe different optical aids employed in visual inspection and illustrate with neat diagrams.	L2	2	10
	ii Briefly explain the essential characteristics of a penetrant used in liquid penetrant testing.	L2	2	6
	Or			
	b Explain how the liquid penetrant test detects surface discontinuities and outline the stages of the procedure.	L2	2	16

13.	a	Explain the principle, procedure, and applications of magnetic particle testing with neat sketches.	L3	3	16
		Or			
	b	Explain the different types of probes used in Eddy Current Testing with neat sketches.	L3	3	16
14.	a	Explain the various radiographic inspection techniques with neat sketches.	L2	4	16
		Or			
	b	Explain the different types of transducers used in ultrasonic testing with neat sketches.	L2	4	16
15.	a	Explain the technique, instrumentation, and applications of acoustic emission testing.	L2	5	16
		Or			
	b	Explain the steps involved in metallographic examination and its significance of microstructural observation.	L2	5	16