



# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Mechanical Engineering

Semester End Examination; July / Aug. - 2022

**Non-Destructive Testing**

Time: 3 hrs

Max. Marks: 100

## Course Outcomes

**The Students will be able to:**

- CO1: Explain various NDT methods and their applications.  
 CO2: Describe magnetic particle inspection and radiographic inspection.  
 CO3: Explain optical holography and Eddy current inspection methods.  
 CO4: Analyze ultrasonic signals, eco and various material scanning methods.  
 CO5: Explain thermal inspection at acoustic emission inspection methods.

**Note:** I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
I a.	Define NDT.	2	L1	CO1	PO1
b.	Mention two applications of magnetic particle inspection.	2	L1	CO2	PO1
c.	Define optical holography.	2	L1	CO3	PO1
d.	Name two methods of ultrasonic inspection.	2	L1	CO4	PO1
e.	list factors influencing acoustic emission testing	2	L1	CO5	PO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	Describe the methods for detection of surface flaws.	9	L2	CO1	PO1
b.	Briefly describe the following:				
	i) Visual inspection	9	L2	CO1	PO1
	ii) Magnetic particle testing				
	iii) Dye Penetrate testing				
c.	Elucidate the principle of Liquid penetrant inspection.	9	L3	CO1	PO1
<b>UNIT - II</b>		<b>18</b>			
2 a.	Describe the working principle of magnetic particle inspection with necessary sketch.	9	L2	CO2	PO1
b.	Mention any 5 advantages and limitations of magnetic particle inspection.	9	L2	CO2	PO1
c.	Characterize x-ray radiography with neat sketch.	9	L3	CO2	PO1
<b>UNIT - III</b>		<b>18</b>			
3 a.	Explain the working principle of optical Holography with neat sketch.	9	L2	CO3	PO1
b.	Explain Eddy current instrument with neat sketch.	9	L2	CO3	PO1
c.	Describe the operating variables of Eddy current inspection.	9	L3	CO2	PO1

**UNIT - IV**

**18**

- 4 a. Describe the principle of ultrasonic inspection. 9 L2 CO3 PO1
- b. Explain with neat sketch the equipment used for computed Tomography. 9 L2 CO3 PO1
- c. Characterize the variables of ultrasonic inspection 9 L3 CO4 PO1

**UNIT - V**

**18**

- 5 a. Describe the working principle of Acoustic emission. 9 L2 CO5 PO1
- b. Explain with sketch felicity ratio. Describe its importance during acoustic emission inspection. 9 L2 CO5 PO1
- c. Describe the fundamental of image processing method using thermal inspection method. 9 L2 CO5 PO1

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