



**P.E.S. College of Engineering, Mandya - 571 401**  
 (An Autonomous Institution affiliated to VTU, Belagavi)  
**Third Semester, B.E. - Industrial and Production Engineering**  
**Semester End Examination; March - 2021**  
**Mechanical Measurement**

Time: 3 hrs

Max. Marks: 100

**Course Outcomes**

The Students will be able to:

CO1: The students should learn and understand necessity of Mechanical Measurements.

CO2: Demonstrate ability to make use of various measuring instruments.

CO3: Students will be able to use different types of Dynamometers.

CO4: The students get exposure to different types of measurements methods.

CO5: Students will be able to demonstrate the need of Radiation Pyrometers 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 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 Piezo-electric effect.	2	L1	CO1	CO1
b.	Enumerate the different types of terminating devices and methods.	2	L1	CO2	CO1
c.	List the different types of electric resistance strain gauges.	2	L1	CO3	CO1
d.	State the principle of Piezo-electric accelerometer.	2	L3	CO4	CO1
e.	State the principle of bimetallic thermometer.	2	L2	CO5	CO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	With a neat sketch, explain the working principle of differential transformer.	9	L2	CO1	PO2
b.	With a neat sketch, explain Ionization transducer.	9	L2	CO1	PO2
c.	With neat sketch, explain telemetry.	9	L2	CO1	PO2
<b>UNIT - II</b>		<b>18</b>			
2 a.	With a neat sketch, explain Vacuum Tube Voltmeter.	9	L3	CO2	PO2
b.	With a neat sketch, explain the working principle of CRO.	9	L2	CO2	PO2
c.	With a neat sketch, explain the working principle of Hydraulic dynamometer.	9	L2	CO2	PO2
<b>UNIT - III</b>		<b>18</b>			
3 a.	With a neat sketch, explain the working principle of electric resistance strain gauges.	9	L3	CO3	PO2
b.	Write a note on;	9	L2	CO3	PO2
	i) Mounting techniques                      ii) Moisture Proofing				
c.	With a neat sketch, explain Tuckerman Optical extensometer.	9	L2	CO3	PO2

**UNIT - IV****18**

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|------|--|---|----|-----|-----|
| 4 a. | With a neat sketch, explain the working principle of Accelerometer.              | 9 | L2 | CO4 | PO2 |
| b.   | With a neat sketch, explain the working principle of strain pressure gauge cell. | 9 | L2 | CO4 | PO2 |
| c.   | With a neat sketch, explain the device used for the measurement of low pressure. | 9 | L2 | CO4 | PO2 |

**UNIT - V****18**

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|------|--|---|----|-----|-----|
| 5 a. | With a neat sketch, explain the working principle of pressure thermometer. | 9 | L2 | CO5 | PO2 |
| b.   | Write a note;  |   |    |     |     |
|      | i) Thermoelectric sensors  | 9 | L2 | CO5 | PO2 |
|      | ii) Electric resistance thermometer  |   |    |     |     |
|      | iii) Semiconductors  |   |    |     |     |
| c.   | With a neat sketch, explain the working principle of optical pyrometer.    | 9 | L2 | CO5 | PO2 |

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