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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 / April - 2022

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
	I : PART - A	**10**			
I a.	List the primary detector transducer element and the operation they perform.	2	L1	CO1	PO1
b.	Enumerate the different types of terminating devices and methods.	2	L1	CO2	PO1
c.	List the desirable characteristics for backing materials of strain gauge.	2	L1	CO3	PO1
d.	State the principle of Piezo-electric accelerometer.	2	L3	CO4	PO1
e.	With neat simple sketch, define see-beck effect.	2	L2	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Explain Ionization transducer with neat sketch.	9	L2	CO1	PO2
b.	With a neat sketch, explain the working principle of sliding contact device. Mention the advantages and disadvantages of electrical transducer elements.	9	L2	CO1	PO2
c.	Explain telemetry with a neat sketch.	9	L2	CO1	PO2
	UNIT - II	**18**			
2 a.	With a neat sketch, explain light beam type oscillograph.	9	L3	CO2	PO2
b.	Explain the working principle of CRO with a neat sketch.	9	L2	CO2	PO2
c.	Explain in detail the working principle of hydraulic dynamometer which is used for torque measurement.	9	L2	CO2	PO2

Contd... 2

	UNIT - III	**18**		
3 a.	With neat sketch, explain unbounded type resistance strain gauge.	9	L3	CO3 PO2
b.	Write a note on : i) Gauge factor ii) Calibration	9	L2	CO3 PO2
c.	Discuss the steps to be taken in the preparation of the specimen mounting of strain gauge.	9	L2	CO3 PO2
	UNIT - IV	**18**		
4 a.	Explain the working principle of accelerometer with neat sketch.	9	L2	CO4 PO2
b.	With a neat sketch, explain Pirani thermal-conductivity gauge.	9	L2	CO4 PO2
c.	List and explain the use of elastic members in pressure measurement.	9	L2	CO4 PO2
	UNIT - V	**18**		
5 a.	State and explain laws of thermocouples.	9	L1	CO5 PO2
b.	With a neat sketch, explain the working principle of liquid in glass thermo meters.	9	L2	CO5 PO2
c.	Explain the working principle of total radiation pyrometer.	9	L2	CO5 PO2

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