PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 28-05-2025   **Time:** 01:00 pm – 04:00 pm

School : SOE	**Program:** B. Tech-MEC	
Course Code : MEC2015	**Course Name:** Metrology & Mechanical Measurement	
Semester: IV	**Max Marks**:100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	4	24	24	24	24

Instructions:

    (i) Read all questions carefully and answer accordingly.

    (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.   **10Q x 2M=20M**

1.	Define Repeatability?	2 Marks	L1	CO1
2.	What is tolerance?	2 Marks	L1	CO1
3.	What is fit?	2 Marks	L1	CO2
4.	What are plain gauages?	2 Marks	L1	CO2
5.	What is internal threading?	2 Marks	L1	CO3
6.	What is pitch in screw thread terminology?	2 Marks	L1	CO3
7.	Give examples of secondary measurement.	2 Marks	L1	CO4
8.	List out types of transducers used in measurement.	2 Marks	L1	CO4
9.	What are the limitation of mechanical gauges?	2 Marks	L1	CO5
10.	What are the application of electrical strain gauges.	2 Marks	L1	CO5

Part B

Answer the Questions.   **Total Marks 80M**

11.	a.	A medium force fit on a 95 mm shaft requires a hole tolerance and shaft tolerance each equal to .225 mm and an maximum	10 Marks	L3	CO2

		interference of 0.0375 mm. Determine the proper hole and shaft dimension with the basis hole standard with tolerance diagram			
	b.	Write a short note on (i) Clearance fit (b) Interference fit (c) Transitional fit	**10 Marks**	**L2**	**CO2**
		Or			
12.	**a.**	A 105 mm shaft rotates in a bearing. The tolerance for both shaft and bearing is 0.075 mm and the required allowance is 0.10 mm. Determine the dimension of the shaft, and the bearing bore with the basis hole standard with tolerance diagram	**10 Marks**	**L3**	**CO2**
	b.	Write a short note on a) Compound tolerance b) Interchangeability	**10 Marks**	**L2**	**CO2**

13.	**a.**	Describe the process of measuring the pitch by using the tool maker's microscope.	**10 Marks**	**L2**	**CO3**
	b.	Explain the process to find the minor diameter by comparative method by using the floating carriage diameter measuring machine and V pieces	**10 marks**	**L2**	**CO3**
		Or			
14.	**a.**	Describe the features coordinate measuring machine (CMM) with its applications.	**10 Marks**	**L2**	**CO3**
	b.	Explain the process of measuring the effective diameter by using the three wire (3W) method.	**10 marks**	**L2**	**CO3**

15.	**a.**	Explain the need and objective of metrology and measurement	**10 Marks**	**L2**	**CO4**
	b.	Describe the Taylor –Hobson Talysurf (contact type) with schematic diagram.	**10 marks**	**L2**	**CO4**
		Or			
16.	**a.**	Explain the generalized measurement system used for measurements with block diagram	**10 Marks**	**L2**	**CO4**
	b.	Describe the process of Profilometer (contact type) to measure the surface finish with simple diagram.	**10 marks**	**L2**	**CO4**

17.	**a.**	Explain the principle and operation pneumatic load cell with simple sketch	**10 Marks**	**L2**	**CO5**
	b.	With simple sketch explain the Prony Brake Dynamometer to measure torque.	**10 Marks**	**L2**	**CO5**
		Or			
18.	**a.**	Explain the Electrical strain gauge system to measure the stain in a given work piece with simple sketch.	**10 Marks**	**L2**	**CO5**
	b.	With simple diagram explain Mechanical Strain gauge to measure strain under static or varying load conditions with advantages and limitations.	**10 marks**	**L2**	**CO5**