

	<p style="text-align: center;"><b>ADAMAS UNIVERSITY</b>  <b>END-SEMESTER EXAMINATION: JANUARY 2021</b>          (Academic Session: 2020 – 21)</p>		
<b>Name of the Program:</b>	B.Tech Mechanical Engineering	<b>Semester:</b>	V
<b>Paper Title:</b>	METROLOGY & MEASUREMENTS	<b>Paper Code:</b>	EME43101
<b>Maximum Marks:</b>	40	<b>Time duration:</b>	03 HRS
<b>Total No of questions:</b>	08	<b>Total No of Pages:</b>	02
(Any other information for the student may be mentioned here)			

**Answer all the Groups**

**Group A**

Answer all the questions of the following

$5 \times 1 = 5$

1. a) What is the difference between Precision and Accuracy?  
b) Define End Standard with an example.  
c) State two characteristics of a Mechanical Comparator.  
d) Name the various characteristics that you would measure in a screw thread.  
e) What are the various factors affecting surface roughness?

**GROUP –B**

Answer any three of the following

$3 \times 5 = 15$

2. Explain the principle of GO and NO-GO gauges.
3. Describe briefly the following method of tooth thickness measurement,  
(i) Constant Chord Method; (ii) Base Tangent Method
4. i) What is sine bar? [2]  
ii) How is it used for angle measurement? [3]
5. i) What is wringing? [2]  
ii) Explain the procedure for wringing of slip gauges. [3]

**GROUP –C**

Answer any two of the following

$2 \times 10 = 20$

6. i) State the basic difference between a gauge and a comparator. [3]  
ii) Design the general type GO and NO-GO gauge for components having 20H7f8 fit: i (micron)=  $0.45(D)^{1/3} + 0.001D$ , Upper Deviation of 'f' shaft = -5.5  $D^{0.41}$ , 20mm falls in the diameter step of 18mm to 30mm, IT7=16i, IT8=25i and Wear Allowance 10% of gauge tolerance. [6]

7. i) A slip gauge set M45 consists of the following:

Range (mm)	Steps (mm)	No. of Blocks
1.001 to 1.009	0.001	9
1.01 to 1.09	0.01	9
1.1 to 1.9	0.1	9
1 to 9	1	9
10 to 90	10	9

Choose suitable minimum number of slips to build up the following dimension a) 43.716 b) 24.095

[5]

ii) What precautions should be taken while using slip gauges?

[5]

8. i) Calculate the effective diameter for M24×3 Plug gauge by using floating carriage micrometer for which readings were taken as: Diameter of standard cylinder 22.001 mm, Micrometer reading over standard cylinder with two wires of same diameter was 12.9334, Micrometer reading over plug screw gauge and wires was 12.1124 mm. Best wire size was used for above measurement. Neglect rake and compression errors. [4]
- ii) Describe the construction and working of a L.V.D.T transducer for measurement of displacement. [6]