

Hall Ticket Number:

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Code No. : 15556 O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) V-Semester Backlog Examinations, Jan./Feb.-2024

Metrology and Instrumentation

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What do you mean by Tolerance?	2	1	1	1
2.	Differentiate between roughness and waviness.	2	1	1	1
3.	Explain the term straightness of a component.	2	2	2	2
4.	List Quantitative methods to measure surface roughness of a component.	2	1	2	1
5.	Define Accuracy and precision in measurement.	2	1	3	1
6.	What do you mean by Span and Range of an Instrument?	2	2	3	1
7.	Explain the working of resistance strain gauge.	2	1	4	2
8.	List the types of Rosette Gauges.	2	1	4	2
9.	List different pressure measuring Instruments.	2	1	5	1
10.	Explain the basic concept of seismic Instrument.	2	1	5	3
Part-B (5 × 8 = 40 Marks)					
11. a)	Explain the different types of Fits with neat sketches and examples.	4	3	1	2
b)	Describe the working principle of sine bar with neat sketch.	4	4	1	4
12. a)	Describe the following Quantitative method to measure surface texture : (i) Average surface Roughness (R_a) (ii) Ten point height Irregularities method (R_z).	4	3	2	3
b)	Explain the working of Auto colimator with a neat sketch.	4	2	2	2
13. a)	Explain the following static characteristics of an Instrument (i) calibration (ii) Hysteresis.	4	2	3	4
b)	Describe briefly the laws of Thermocouple.	4	2	3	3
14. a)	Explain the working principle of LVDT with a neat sketch.	4	3	4	3
b)	Explain the wire type and Foil type resistance strain gauge.	4	3	4	2

Contd... 2

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15. a)	Describe briefly the pressure measurement using Bulk modulus pressure gauge.	4	3	5	2
b)	Explain briefly the operation of strain gauge accelerometer.	4	2	5	1
16. a)	Explain the Taylors principle of Limit Gauges.	4	4	1	1
b)	Explain the Taylor Hobson Talysurf method of measuring surface roughness.	4	3	2	3
17.	Answer any <i>two</i> of the following:				
a)	Discuss the working principle of Thermocouple.	4	3	3	1
b)	Discuss the working of strain gauge load cell	4	2	4	2
c)	Explain the working principle of vacuum pressure measurement using pirani gauge.	4	3	5	2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	21%
ii)	Blooms Taxonomy Level – 2	31%
iii)	Blooms Taxonomy Level – 3 & 4	49%
