

A

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: U4705

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Fourth Semester

Mechanical Engineering

21UME405- MEASUREMENTS AND INSTRUMENTATION

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. The degree of closeness of the measured value of a certain quantity with its true value is known as _____.
(a) Accuracy (b) Precision (c) Standard (d) Sensitivity CO1-U
2. Systematic errors are CO1-U
(a) Randomly distributed (b) Regularly repetitive in nature
(c) Distributed on both + ve and - ve sides of mean value (d) Unknown errors
3. From which category 'Sigma comparator' belongs? CO1-U
(a) Optical comparator (b) Mechanical comparator
(c) Mechanical-optical comparator (d) Pneumatic comparator
4. What is used to measure the major diameter of an external thread? CO1-U
(a) Bench micrometer (b) Thread micrometer
(c) One wire method (d) All of the above
5. Which of the following is a contact type of automated inspection method? CO1-U
(a) Inspection probe (b) Laser scanning
(c) Electric field (d) All of the above
6. The current generation CT scanner use _____ for scanning CO1-U
(a) pencil beam and stationary detectors (b) pencil beam and rotating detectors
(c) fan beam and detectors (d) electron beam and detectors

7. Which of the following devices can be used for measuring torque? CO1-U
 (a) Helical spring (b) Flat spiral spring (c) Bellows (d) Diaphragm
8. Load cells are used for measuring _____ CO1-U
 (a) Large weights only (b) Small weights only
 (c) Weights moving in high speed (d) Slowly moving weight
9. The data acquisition system implies input data collection _____ CO1-U
 (a) in mixed signal form (b) in analog form
 (c) in digital form (d) in the form of binary codes
10. Amplified input signal is digitized through _____ CO1-U
 (a) A/D converters (b) D/A converters
 (c) Rectifiers (d) Sigma delta modulators

PART – B (5 x 2= 10Marks)

11. Define the term reliability. CO1-U
12. State the principle of interferometry. CO1-U
13. What are the benefits of using CMM? CO1-U
14. Differentiate between primary and secondary transducers CO1-U
15. Outline piezoelectric effect CO1-U

PART – C (5 x 16= 80Marks)

16. (a) Discuss the different types of errors and how they can be eliminated? CO1- U (16)
- (b) Draw the block diagram of generalized measurement system and explain different stages with examples. CO1- U (16)
17. (a) Explain the construction and working of Vernier caliper used for linear measurement CO1- U (16)
- Or
- (b) Explain the working principle of angle Dekkor with a neat sketch. Also write the applications of angle Dekkor. CO1- U (16)

- 18 (a) Explain the working process of Machine vision system, components, application and Benefits. CO1 -U (16)
- (b) Discuss the need, types and constructional features of coordinate measuring machine CO1 -U (16)
- 19 (a) Explain with a neat diagram construction and working an eddy current dynamometer CO1- U (16)
- Or
- (b) Explain with a neat diagram construction and working of a prony brake for estimating power. CO1- U (16)
- 20 (a) Describe the different criteria for selection of transducer for a particular application. CO1- U (16)
- Or
- (b) Describe with the neat block diagram explain single and multichannel data acquisition system. Give example for each. CO1- U (16)

