Reg. No: | | | | | | | | | | | | |

Question Paper Code: U4705

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

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 following is an internationally recognized and accepted unit system _____ . CO1-U

   (a) MKS (b) FPS (c) SI (d) All of the above

2. The degree of closeness of the measured value of a certain quantity with its true value is known as _____ . CO1- U

   (a) Accuracy (b) Precision (c) Standard (d) Sensitivity

3. Up to which angle sine bars can measure the angles? CO1 -U

   (a) 45 degree (b) 60 degree (c) 90 degree (d) 120 degree

4. From which category ‘Sigma comparator’ belongs? CO1 -U

   (a) Optical comparator (b) Mechanical comparator

   (c) Mechanical-optical comparator (d) Pneumatic comparator

5. 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

6. Which of the following image processing approaches is the fastest, most accurate, and flexible CO1 -U

   (a) Photographic (b) Electronic (c) Digital (d) Optical

7. Bourdon tube sensors are used for the measurement of CO1 -U

(a). Gauge pressure (b) Condensation temperature

(c) Concentration of suspended materials in air (d) Humidity

8. Output of a bimetallic element will be _____ CO1- U

(a) Strain (b) Pressure (c) Displacement (d) Voltage

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. Transducer produces a _____ CO1 -U

(a) proportional current (b) proportional voltage

(c) proportional resistance (d) proportional power

PART – B (5 x 2= 10Marks)

11. Classify the errors. CO1- U

12. How the mechanical comparator is used? CO1- U

13. What are the benefits of using CMM? CO1 -U

14. Explain various types of dynamometers used for power measurements CO1 -U

15. Outline piezoelectric effect CO1 -U

PART – C (5 x 16= 80Marks)

16. (a) Describe the structure of generalized measuring system and explain. CO1- U (16)

Or

(b) Discuss the different types of errors and how they can be eliminated? CO1- U (16)

17. (a) Explain the working principle of mechanical comparator and Pneumatic comparator 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) Distinguish the procedure to be used in measurement of various dimensions of a typical component using a cantilever type CMM. CO1- U (16)

Or

	(b)	Explain the working process of Machine vision system, components, application and Benefits.	CO1- U	(16)
19.	(a)	Describe in details of the function and application of fluid friction dynamometers	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 write a detailed technical note on smart sensors. Explain also the various built in features of them compared to conventional sensors.	CO1- U	(16)
		Or		
	(b)	Design the Block diagram arrangement of DAS and describe the function of each component and also state its applications	CO1- U	(16)