A   **Reg. No. :**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 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 principle of 'Interchangeability' is normally employed for _____.   CO1- U

   (a) Mass production   (b) Production of identical parts

   (c) Parts within the prescribed limits of sizes   (d) All of the above

2. Error of measurement _____ .   CO1- U

   (a) True value – Measured value   (b)Precision – True value

   (c) Measured value – Precision   (d)None of the above

3. GO' and 'NO GO' gauge is a type of _____ .   CO1 -U

   (a) plug gauge   (b) slip gauge   (c) ring gauge   (d)limit gauge

4. Thread ring gauge is used for checking   CO1 -U

   (a) external threads   (b) internal threads

   (c) external diameter of cylindrical job   (d) internal diameter of jobs

5. Which type of CMM is most suited for large heavy work pieces?   CO1 -U

   (a) Cantilever type   (b) Bridge type

   (c) Horizontal boring mill type   (d) Floating bridge type

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

   (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. Outline the measurement? Give its types.   CO1- U

12. Mention the purpose of Goniometric heads in tool makers microscope?   CO1- U

13. Discuss the use of computers in the field of metrology   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) Explain the classification of various measuring methods.   CO1- U   (16)

                         Or

    (b) Describe the different types of error in measurement and their   CO1- U   (16)
         causes and control methods in detail?

17. (a) Explain the working principle of mechanical comparator and   CO1- U   (16)
         Pneumatic comparator

                         Or

    (b) Explain the working principle of angle Dekkor with a neat sketch.   CO1- U   (16)
         Also write the applications of angle Dekkor.

18. (a) Discuss in details of the function and application of advanced   CO1- U   (16)
         Computed Tomography system?

                         Or

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(b) Explain the working process of Machine vision system, components, application and Benefits. 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) Discuss in brief on the following. CO1- U (16)
(i) Resistive transducer, (ii) Capacitive transducer&
(iii) Inductive Transducers

OR

(b) Discuss in brief on the following. (i) Piezoelectric effect, (ii) Hall effect CO1- U (16)

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