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Question Paper Code: 95704

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

Fifth Semester

Mechanical Engineering

19UME504– MEASUREMENTS AND INSTRUMENTATION

(Regulations 2019)

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 _____ CO1- U
(a) Accuracy (b) Precision (c) Standard (d) Sensitivity
2. The following is a line standard of measurement _____. CO1- U
(a) Measuring tape (b) Slip gauge (c) Micrometer (d) End bars
3. The following is not used to measure angles _____. CO2- U
(a) Bevel protectors (b) Calibrated levels (c) Clinometers (d) Optical flats
4. Which of the following is not used in making of sine bars? CO2- U
(a) High carbon (b) High chromium (c) Corrosion resistant steel (d) Aluminium
5. Which of the following is a contact type of automated inspection method? CO3- U
(a) Inspection probe (b) Laser scanning (c) Electric field (d) All of the above
6. What is the accuracy of present day co-ordinate measuring machine? CO3- U
(a) 10 microns (b) 5 microns (c) 2 microns (d) 1 micron
7. Odometer is used to measure _____. CO4- U
(a) Threshold odours (b) Composition of gases
(c) Suspended solids in a gas (d) Distances
8. Output of a bimetallic element will be _____. CO4- U
(a) Strain (b) Pressure (c) Displacement (d) Voltage

9. A typical data acquisition system consists of _____ CO1- U
 (a) op amps (b) sensors (c) rectifiers (d) transistors
- 10 Transducer produces a _____ CO1- R
 (a) proportional current (b) proportional voltage
 (c) proportional resistance (d) proportional power

PART – B (5 x 2= 10 Marks)

- 11 Define the term reliability. CO1- U
- 12 List any four angular measuring instruments. CO2- U
- 13 List the various geometrical checks made on machine tools. CO3- U
- 14 What is the working principle behind strain gauges? CO4- U
- 15 Explain the basic requirements of the transducer? CO4- U

PART – C (5 x 16= 80 Marks)

- 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 with a neat sketch how a micrometer is used for linear measurement. CO2-U (16)
 Or
 (b) Explain in detail the various methods used for checking the profile of a spur gear Profile checking. CO2-U (16)
- 18 (a) Briefly explain the calibration of three co-ordinate measuring machine with sketch and state the advantages of CMM. CO3-U (16)
 Or
 (b) Describe in details of the function and application of Machine vision system. CO3-U (16)
19. (a) Explain the neat diagram construction and working of any two methods of measuring force. CO4-U (16)
 Or
 (b) Discuss the working principle of bourdon tube pressure gauge. CO4-U (16)

20. (a) Describe the different criteria for selection of sensors for a particular application. CO5-U (16)
- Or
- (b) Describe with neat block diagram describe about the digital data, acquisition System. CO5-U (16)

