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Question Paper Code: 56702

B.E./B.Tech. DEGREE EXAMINATION, NOV 2022

Sixth Semester

Mechanical Engineering

15UME602- ENGINEERING METROLOGY AND MEASUREMENTS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The ability by which a measuring device can detect small difference in the quantity being measured by it, is called its CO1- R
(a) Damping (b) Sensitivity (c) Accuracy (d) Precision
2. The maximum allowable limit of a measurement may vary from the true value is called CO1- R
(a) Permissible error (b) Expected error (c) Range of error (d) Least error
3. The thread micrometer measures CO2- R
(a) The major diameter of the thread (b) The minor diameter of the thread
(c) The effective diameter of the thread (d) The root diameter of the thread
4. Which of the following is not a type of direct measuring instrument CO2- R
(a) Micrometer (b) Divider (c) Vernier caliper (d) Tachometer
5. The tooth of the gear traces is not in the form of curved line is called CO3- R
(a) Spur gear (b) Helical gear (c) Bevel gear (d) Spiral gear
6. V block is used in the workshop to check CO3- R
(a) Roundness of a cylindrical work (b) Surface roughness
(c) Taper on a job (d) None of the above
7. The alignment test is also called CO4- R
(a) Geometrical test (b) Practical test (c) Linear test (d) Angular test
8. In CMM, the life cycle activities of requirements analysis, design, code, and test are described in CO4- R
(a) Production engineering (b) Quality assurance
(c) Subcontract management (d) Quality management

9. The flow meter used for corrosive liquid is CO5- R
 (a) Turbine meter (b) Anemometer (c) Magnetic flow meter (d) Manometer
10. Which of the following can be used for measuring temperature? CO5- R
 (a) Metallic diaphragm (b) Fluid expansion system
 (c) Capsule (d) Bourdon tube

PART – B (5 x 2= 10Marks)

11. Differentiate between precision and accuracy. CO1- U
12. List any four linear measuring instruments. CO2- U
13. Name the various methods for measuring effective diameter. CO3- R
14. Why the laser is used in alignment testing? CO4- R
15. Mention any four advantages of column type CMM CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw the block diagram of a generalized measurement system and explain the various elements of measurement systems. CO1- U (16)
- Or
- (b) State the purpose of calibrating the instruments and discuss the primary and secondary calibration. CO1- U (16)
17. (a) Illustrate the construction and working principles of micrometer with neat sketch. CO2- U (16)
- Or
- (b) Explain with the help of neat sketches, the working and application of an autocollimator CO2- U (16)
18. (a) (i) Explain the terminologies related with screw thread CO3- U (8)
 (ii) Briefly explain the error in thread CO3- U (8)
- Or
- (b) Explain the principle of measuring gear tooth thickness by base tangent method. CO3- U (16)
19. (a) Discuss laser telemetric system with suitable diagram. CO4- U (16)
- Or
- (b) Describe the construction, working principle and applications of CMM to measure the form features of cylinder block. CO4- U (16)

20. (a) With neat sketch explain the construction and working principle of vapour pressure thermometer CO5- U (16)

Or

- (b) Discuss in detail about the working principle of thermocouples in home appliances. CO5- U (16)

