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Question Paper Code: 46703

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Mechanical Engineering

14UME603 - ENGINEERING METROLOGY AND MEASUREMENTS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Precision is
 - (a) Accuracy of the measurement.
 - (b) Repeatability of the measuring process
 - (c) Defect less measurement
 - (d) All the above

2. Accuracy of measuring equipment is
 - (a) The closeness with which a measurement can be read directly from a measuring instrument
 - (b) A measure of how close the reading is to the true size
 - (c) The difference between measured value and actual value
 - (d) The smallest change that can be measured

3. Engineering Metrology is a
 - (a) Measurement organisation
 - (b) Measurement of time
 - (c) Measurement of errors
 - (d) Measurement of linear and angular terms.

4. Grade I angle plates are
 - (a) All exterior faces are finished by planning operation
 - (b) All exterior faces are finished by grinding operation
 - (c) All exterior and interior faces and edges are finished by milling operation
 - (d) All exterior and interior faces and edges are finished by grinding operation

5. Gear tooth vernier is used to measure

(a) gear tooth profile	(b) gear tooth thickness
(c) pitch line thickness of gear tooth	(d) module

6. Universal surface gauge is used for

(a) checking straightness	(b) checking flatness
(c) checking parallelism	(d) layout work and inspection

7. Optical fiber operates on the principle of

(a) Total internal reflectance	(b) Tyndall effect
(c) Photo-electric effect	(d) Laser technology

8. CMMs are mainly used in

(a) Design of components	(b) Forward Engineering
(c) Reverse Engineering	(d) Inspection of components

9. Proving ring is a device used to measure

(a) Force	(b) Pressure	(c) Torque	(d) All the above
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10. Pyrometer is a device which is used to

(a) Measure the force	(b) Measure velocity
(c) Measure flow	(d) Measure temperature

PART - B (5 x 2 = 10 Marks)

11. What is interchangeability?
12. Write Taylor principle in gauge design.
13. List the various methods used for measuring the gear tooth thickness

14. What are the advantages of laser interferometer?

15. State the working principle of pitot tube

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail various types of errors that may arise in engineering measurements and the ways to control it. (16)

Or

(b) Explain the various types of errors in measuring system (16)

17. (a) (i) With necessary sketches explain the working principle of tool makers microscope. (8)

(ii) Explain the gauge design terminology with procedure and neat sketch. (8)

Or

(b) Explain with a neat sketch, the construction and working of a Autocollimator. (16)

18. (a) How to measure the specifications of the screw thread by using the tool maker's microscope? Discuss in detail. (16)

Or

(b) Explain about the Tomlinson surface meter. (16)

19. (a) With necessary sketches explain the principle of laser interferometer and also state its applications (16)

Or

(b) Discuss the various types of CMM based up on its construction (16)

20. (a) Discuss the working principle, advantages and disadvantages of

(i) Pitot tube (5)

(ii) Rotameter (5)

(iii) Hydraulic force meter (6)

Or

(b) With necessary sketch explain how bimetallic strip thermo meter is used to measure the temperature. (16)

