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**Reg. No. :**

**Question Paper Code: 46073**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

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. 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

2. Precession is

(a) Accuracy of the measurement. (b)Repeatability of the measuring process

(c) Defect less measurement (d)All the above

3. Plug gauges are used to

(a) Measure the diameter of the work pieces (b) Measure the diameter of the holes in work pieces (c) Check the diameter of the holes in work pieces (d) Check the length of the holes in work pieces

4. Engineering Metrology is a

(a) Measurement organisation (b) Measurement of time

(c) Measurement of errors (d) Measurement of linear and angular terms

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. Repetitive deviations from the normal surface which forms the pattern on the surface is

called as

(a) Surface (b)Surface texture (c) Flaw (d)profile

7. CMMs are mainly used in

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

8. Inspection is a process of

(a) Ensuring the functional aspect of the component

1. Verifying the dimensional aspect of the component

(c) All the above

(d) None of the above

9. Common materials used for bi-metallic thermometer is

(a) Copper and Nickel (b) Steel and Nickel (c) Steel and Copper (d) Copper and Aluminum

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| 10. Proving ring is a device used to measure   1. Force (b)Pressure (c)Torque (d)All the above |

PART - B (5 x 2 = 10 Marks)

11. Distinguish between Line standard and End standard.

12. What is comparator?

13. Define lead

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) (i) State the basic requirements for an instrument to operate accurately. (6)

(ii) Explain the different types of standards. (10)

Or

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

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

Or

(b) Discuss the various types of limit gauges with necessary illustrations. (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) (i) With necessary illustrations explain the Parkinson gear tester with necessary

diagram. (12)

(ii) Describe the factors affecting the surface roughness (4)

19. (a) How are CMMs classified with respect to constructional features? Sketch and state

their main applications, merits and demerits. (16)

Or

(b) With necessary sketches explain the principle of laser interferometer and also state

its applications. (16)

20. (a) Briefly explain the various methods of measuring temperature. (16)

Or

(b) (i) Discuss the working principle of venturi meter with neat sketch. (8)

(ii) Discuss the working principle of hydraulic dynamometer (8)