

GBCS SCHEME



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18ME36B/18MEB306

Third Semester B.E. Degree Examination, July/August 2021 Mechanical Measurements and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain with a neat sketch International Prototype Meter. (07 Marks)
b. Discuss the following standards of measurement:
(i) Line standard (ii) Wavelength standard (iii) End standard (06 Marks)
c. Explain the classification of standards. (07 Marks)
- 2 a. Explain with a sketch working of Auto Collimator. (07 Marks)
b. Build dimension of 49.3115 mm and 68.208 mm using M112 set slip gauges. (06 Marks)
c. Explain the process of wringing of slip gauges. (07 Marks)
- 3 a. Explain with a sketch Hole base system and Shaft base system. (07 Marks)
b. What is a fit? Explain different types of fits. (07 Marks)
c. Differentiate between Inter Changeability and Selective assembly. (06 Marks)
- 4 a. Determine the tolerances on a hole and shaft for a running fit 50H7/96. Given:
(i) 50 mm lies between 30-50 mm
(ii) $i = 0.45 \sqrt[3]{D} + 0.001D$
(iii) Fundamental deviation for 'H' hole = 0
(iv) Fundamental deviation for 'g' shaft = $-2.5 D^{0.34}$
(v) IT7 = 16i, IT6 = 10i (07 Marks)
b. Explain the needs and characteristics of comparators. (06 Marks)
c. Explain with a sketch construction and working of LVDT. (07 Marks)
- 5 a. Explain with a sketch working of Tool Maker's microscope. (07 Marks)
b. Sketch and explain the two-wire method of measuring the effective diameter of a screw thread. (07 Marks)
c. Derive the expression for Best Size Wire. (06 Marks)
- 6 a. Explain with a neat diagram construction and working of coordinate measuring machine. (08 Marks)
b. Explain: (i) Runout (ii) Concentricity (iii) Involute profile (iv) Composite error (12 Marks)
- 7 a. Explain with an example Generalized measurement system. (08 Marks)
b. Explain: (i) Accuracy (ii) Threshold (iii) Hysteresis (iv) Sensitivity (12 Marks)
- 8 a. Explain with a neat sketch Ballast circuit. (10 Marks)
b. Explain with a neat sketch working of Cathode Ray Oscilloscope (CRO). (10 Marks)
- 9 a. Explain with a neat sketch working of proving ring. (10 Marks)
b. Explain with a sketch McLeod Gauge. (10 Marks)
- 10 a. Explain with a sketch Wheatstone Bridge arrangement for strain measurement. (10 Marks)
b. What is a thermocouple? Explain the law of thermocouples. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.