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10ME/AU42B/10MEB/AUB402



Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Mechanical Measurements and Metrology

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. What is metrology? Compare line standard with end standard with suitable examples. (08 Marks)
- b. What is wringing? Explain the procedure for wringing of slip gauges. (06 Marks)
- c. Three 100 mm end bars are measured using a Brooke's level comparator by first wringing them together and comparing with a 300 mm bar and then inter comparing them. The 300 mm bar actually measures 300.042 mm and the three bars together measures 0.064 mm less than 300 mm bar. Bar A is 0.018 mm longer than bar B and 0.023 mm longer than bar C. Find actual length of each bar. (06 Marks)
- 2 a. Explain principles of interchangeability and selective assembly with suitable example. (06 Marks)
- b. Explain Taylor's principle in the design of limit gauges. (06 Marks)
- c. With the help of neat sketches explain ring gauge and plug gauge. (08 Marks)
- 3 a. What is a comparator? With a neat sketch explain the working of reed-type mechanical comparator. (08 Marks)
- b. Explain the principle and working of a sine bar. (08 Marks)
- c. What are the advantages and disadvantages of LVDT? (04 Marks)
- 4 a. With a neat sketch explain the principle of working of an auto collimator. (07 Marks)
- b. Describe the two-wire method of measuring effective diameter and derive the equation for the same. (07 Marks)
- c. With a neat sketch explain the terminology of a screw thread. (06 Marks)

PART - B

- 5 a. With the help of a block diagram, explain generalized measuring system. Give suitable example. (08 Marks)
- b. Explain the following with respect to an instrument; (i) sensitivity (ii) threshold (iii) hysteresis (iv) loading effect. (12 Marks)
- 6 a. List the advantages and disadvantages of telemetry system. (04 Marks)
- b. Explain the working of vacuum tube amplifier with the help of a circuit diagram. (08 Marks)
- c. What are XY plotters? With a block diagram, explain its working. (08 Marks)
- 7 a. Explain with a sketch, the working of proving ring. (06 Marks)
- b. With a neat sketch, explain prony brake dynamometer. List its limitations. (08 Marks)
- c. With a sketch explain pirani thermal conductivity gauge. (06 Marks)
- 8 Write short notes for any FOUR of the following:
 - a. Thermocouples
 - b. Electrical strain gauges
 - c. Radiation pyrometer
 - d. Gauge factor
 - e. Calibration of strain gauges

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(20 Marks)

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.