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10ME/AU32B

Third Semester B.E. Degree Examination, June/July 2017
Mechanical Measurements & Metrology

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Define measurement. List the objectives of metrology. (06 Marks)
 - b. Describe with neat sketch,
 - (i) International prototype meter. (10 Marks)
 - (ii) Imperial standard yard. (04 Marks)
 - c. Write a brief note on slip gauges. (04 Marks)
- 2 a. Determine the tolerance on the hole and shaft for a precision running fit designated by 50H7g6:
 Given : (i) 50 mm lies between 30 – 50 mm
 (ii) i (microns) = $0.45D^{\frac{1}{3}} + 0.001D$
 (iii) Fundamental deviation for 'g' shaft = $-2.5D^{0.34}$
 (iv) IT7 = 16i
 (v) IT6 = 10i
 State the actual maximum and minimum sizes of the hole and shaft and maximum and minimum clearances. (12 Marks)
 - b. Explain hole basis and shaft basis system. (04 Marks)
 - c. Explain inter changeability and wear allowance. (04 Marks)
- 3 a. With the help of a sketch, explain sigma comparators. (10 Marks)
 - b. Explain with a neat sketch, the construction and working of LVDT. (10 Marks)
- 4 a. With a neat sketch, explain auto collimeter. (12 Marks)
 - b. Explain three wire method of measuring effective diameter of screw thread. (08 Marks)

PART – B

- 5 a. With a block diagram, explain the generalized measurement system with example. (10 Marks)
 - b. Define the following terms:
 - (i) Accuracy
 - (ii) Repeatability
 - (iii) Sensitivity
 - (iv) Calibration
 - (v) Hysterisis. (10 Marks)
- 6 a. Explain with a neat sketch, the working principle of CRO. (10 Marks)
 - b. With a neat sketch, the working of X-Y plotters. (10 Marks)
- 7 a. With a neat sketch, explain hydraulic dynamometer and mention its advantages and disadvantages. (10 Marks)
 - b. With a neat sketch, explain the working principle of proving ring. (10 Marks)
- 8 a. With a neat sketch, explain the working of optical pyrometer. (12 Marks)
 - b. What is thermo couple? State the laws of thermo couple. (08 Marks)

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