USN [ ][ ][ ][ ][ ][ ][ ][ ][ ]   **10ME/AU32B**

Time: 3 hrs.   Max. Marks:100

Note: *1. Answer any FIVE full questions, selecting*
atleast TWO questions from each part.
2. Draw neat sketches.

PART – A

1 a. Define metrology. State and explain the objectives of metrology.   (06 Marks)
   b. Sketch and explain: i) International prototype metre; ii) Imperial standard yard. (10 Marks)
   c. Write the slip gauge combination to build the following dimensions using M-87 slip gauge
       set: i) 49.3825mm; ii) 87.3215mm.   (04 Marks)

2 a. Determine the dimensions of the shaft and hole for a fit $30H_8d_{10}$ and sketch the fit, given
       i)   i(micron) i $= 0.45 D^{1/3} +0.001D$.
       ii) Upper deviation for 'd' shaft $= -16_D^{0.44}$.
       iii) 30mm falls in the diameter steps of 18-30mm.
       iv) $IT_8 = 25i$
       v) $IT_{10} = 64i$
       vi) Fundamental deviation $= 0$.   (12 Marks)
   b. With a neat sketch, explain the different types of fits with examples.   (08 Marks)

3 a. List the characteristics of comparator.   (05 Marks)
   b. Explain with a neat sketch, the construction and working of Johnson Mikrokator and state
       advantages.   (10 Marks)
   c. List the advantages and disadvantages of optical comparator.   (05 Marks)

4 a. Explain with a diagram, the method to measure minor diameter of internal screw thread
       using taper parallels and rollers.   (10 Marks)
   b. Derive an expression for best size wire.   (06 Marks)
   c. What are various types of errors on screw threads and explain the reasons for the same?
                                                                              (04 Marks)

PART – B

5 a. With a neat block diagram, explain the three stages of generalized measurement system,
       with an example.   (10 Marks)
   b. Explain with neat sketch capacitive transducers of changing area and changing distance.
                                                                              (10 Marks)

6 a. With a neat block diagram, explain the working principle of Cathode Ray oscilloscope.
                                                                              (10 Marks)
   b. What are X-Y plotters? With a block diagram, explain its working.   (10 Marks)

7 a. Explain Prony brake dynamometer with neat sketch.   (10 Marks)
   b. With a neat sketch, explain Mc Leod gauge.   (10 Marks)

8 a. With a neat sketch, explain the working principle of optical pyrometer. (10 Marks)
   b. Write short notes on the following: i) Gauge factor; ii) Bonding methods; iii) Thermo
       couple; iv) Bonding materials.   (10 Marks)

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