CBCS SCHEME

USN | | | | | | | | | | |

18AE36

Third Semester B.E. Degree Examination, June/July 2023
Measurements and Metrology

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define calibration and explain procedure for calibration of end bar. **(08 Marks)**

b. Describe with neat sketch Imperial Standard Yard **(06 Marks)**

c. Define following :
i) Standard ii) Error **(06 Marks)**

OR

2 a. Write a note on Slip gauges. **(06 Marks)**

b. Build a dimension of 35.4875mm using M112 set. Use two protector slips of 2.5mm each. **(08 Marks)**

c. Discuss the following standards of measurement:
i) Line standard ii) Wavelength standard iii) End standard **(06 Marks)**

Module-2

3 a. Explain Taylor's principle for the design of limit gauges. **(10 Marks)**

b. Determine the dimensions of the shaft and hole for a fit 30 H_8/d_{10} and sketch the fit, given the following data:
i) Determine 30 falls in the diameter range 18 – 30, upper deviation for 'd' shaft is $-16D^{0.44}$
ii) $i = 0.45D^{1/3} + 0.001D$. Tolerance for $IT_8 = 25i$, Tolerance for $IT_{10} = 64i$. **(10 Marks)**

OR

4 a. Differentiate between hole basis system and shaft basis system with sketches. **(10 Marks)**

b. Explain the following :
i) Clearance fit ii) Interference fit. **(10 Marks)**

Module-3

5 a. Explain with sketch dial indicator. **(10 Marks)**

b. Explain the principle of working with a sketch :
i) Angle gauges ii) Bevel protractor. **(10 Marks)**

OR

6 a. With neat sketch show all the terminologies of a spur gear. **(10 Marks)**

b. Derive an expression for the best wire size used in the 2/3 wire method. **(10 Marks)**

Module-4

7 a. Describe the 3 stages of measurement with a suitable example. **(10 Marks)**

b. With a sketch explain piezoelectric transducer. **(10 Marks)**

OR

8 a. Define transducer. Explain with sketch Mechanical Transducer. **(10 Marks)**

b. Explain resistive type transducer used to meâsure angular measurement. **(10 Marks)**

Module-5

9 a. Explain with neat sketch the platform balance. (10 Marks)
b. Write a note on electrical resistance strain gauges. (10 Marks)

OR

10 a. State and explain the laws of thermocouple. (10 Marks)
b. With neat sketch explain electric dynamometer. (10 Marks)

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