CBCS Scheme

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

15AU35

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

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. What is the significance of measurement system? **(04 Marks)**

b. Define the following terms as applied to measurement system (i) Accuracy (ii) Precision (iii) Calibration (iv) Threshold. **(04 Marks)**

c. What are the causes of errors in measurement? Give the detailed classification of errors. **(08 Marks)**

OR

2 a. State any four objectives of metrology. **(02 Marks)**

b. Describe with neat sketches: (i) Imperial standard yard (ii) International prototype meter. **(08 Marks)**

c. A calibrated meter end bar has an actual length of 1000.0003 mm. It is to be used in calibration of two bars A and B each having a basic length of 500 mm. When compared with the meter bar $l_a + l_b$ was found to be shorter by 0.0002 mm. In comparing A with B it was found that A was 0.0004 mm longer than B. Find the actual length of A and B. **(06 Marks)**

Module-2

3 a. What are the required characteristics of comparators? **(04 Marks)**

b. With neat sketch describe the construction and working of sigma comparator. **(12 Marks)**

OR

4 a. List any two advantages and disadvantages of LVDT. **(04 Marks)**

b. Explain the use of sine far for measuring known angles. **(06 Marks)**

c. Give the combination of angle gauges to obtain, (i) 33°16′42″ (ii) 102°8′42″ **(06 Marks)**

Module-3

5 a. Define transfer efficiency. **(02 Marks)**

b. Explain briefly the various types of mechanical transducer elements. **(08 Marks)**

c. Explain with sketch the working of an electronic transducer. **(06 Marks)**

OR

6 a. What are the advantages of electrical methods of intermediate modifying system? **(04 Marks)**

b. Illustrate the principle of interferometry with sketches. **(08 Marks)**

c. Write a note on optical flats. **(04 Marks)**

Module-4

7 a. What are the methods of force measurements? **(04 Marks)**

b. Explain with a sketch the working principle of prony brake dynamometer. **(06 Marks)**

c. Explain with a sketch working of proving ring. **(06 Marks)**

OR

8	a.	With a sketch, explain the important parts of a CRO.	**(08 Marks)**
	b.	With a block diagram, explain the working of X-Y plotters.	**(08 Marks)**

Module-5

9	a.	Differentiate between interchangeability and selective assembly.	**(04 Marks)**
	b.	Discuss hole basis and shaft basis system of fits.	**(08 Marks)**
	c.	Illustrate geometrical tolerances with examples.	**(04 Marks)**

OR

10	a.	What are the steps to be taken in mounting of strain gauges?	**(04 Marks)**
	b.	Explain with a sketch the working of Mcleod gage.	**(08 Marks)**
	c.	State the laws of thermocouple.	**(04 Marks)**

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