B.Tech. – VIEP – MECHANICAL ENGINEERING (BTMEVI)

Term-End Examination

December, 2016

00062

BIME-019 : METROLOGY

Time : 3 hours   *Maximum Marks : 70*

Note : Attempt any five questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a)   What are primary, secondary and tertiary measurements ? Explain with suitable examples.   7

    (b)   Draw a block diagram representation of a generalised measurement system. Explain the various elements and the functions performed by each element.   7

2. (a)   Define sensitivity. Would you prefer sensitivity to be low or high for an instrument ? Justify.   7

(b) A pressure gauge having a range of 1000 kN/m^2 has guaranteed accuracy of 1% of full scale deflection.

    (i) What would be the possible readings for a true value of 100 kN/m^2 ?

    (ii) Estimate the possible readings, if the instrument has an error of 1% of the value.   7

3. (a) Explain the difference between threshold and resolution.   7

    (b) Explain the causes of interference errors, instrument interference and environment interference, giving suitable examples.   7

4. (a) What is a comparator ? Classify the different types of comparators. Describe the advantages and disadvantages of each type.   7

    (b) Describe the Co-ordinate Measuring Machine (CMM) and its main elements.   7

5. (a) Explain with the help of suitable examples, the adverse effects of poor surface finish.   7

    (b) Describe how can pitch of a screw thread be measured on a pitch measuring machine.   7

6. (a) Explain the repeatability of a measuring instrument. How will you check the repeatability of an instrument ?   7

    (b) What are the control charts for attributes ? Explain.   7

7. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

   (a)   Nominal Size

   (b)   Fits

   (c)   Statistical Quality Control

   (d)   Primary Texture

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