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BIME-019

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

Term-End Examination

00993

June, 2018

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) Define measurement. Explain its significance in various fields of engineering. 7

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

2. (a) What are the different sources of errors in measurement and measuring instruments ? Explain. 7

(b) Define sensitivity. Would you prefer sensitivity to be low or high for an instrument ? Justify your answer. 7

3. (a) A pressure gauge having a range of 1000 kN/m^2 has guaranteed accuracy of 1% of full scale deflection. 7

(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.

(b) What are angle gauges ? How are they applied in measurements ? 7

4. (a) Describe the working of an interferometer with the help of a neat diagram. 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) Explain the three-wire method of measuring effect diameter of a screw thread. 7

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

(b) Explain the functions of Statistical Quality Control (SQC). Discuss the advantages. 7

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

(a) Sampling Plan

(b) Tool Maker's Microscope

(c) Visual Inspection

(d) Environmental Error