B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. Semester: III
Branch: Industrial Engineering and Management Duration: 3 hrs.
Course Code: 22IM3PCIME Max Marks: 100
Course: Industrial Metrology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) Define Metrology and explain the Objectives. **06**

b) Explain briefly subdivisions of standards **06**

c) A calibrated meter end bar has an actual length of 1000.0003mm. It is to be used in the calibration of two bars A and B, each having a basic length of 500mm. When compared with the meter bar $L_A + L_B$ was found to be shorter by 0.0002mm. In comparing A and B it was found that A was 0.0004 mm longer than B. Find the actual length of A and B. **08**

OR

2 a) Explain how tolerance and cost are related. **06**

b) With sketches, explain types of tolerances. **06**

c) List and explain any two types of Fits with diagram. **08**

UNIT - II

3 a) Explain general principle, basic features and characteristics of comparator. **06**

b) Explain Parkinson's gear tester. **06**

c) With the help of sketch, Explain the terminology of screw threads. **08**

UNIT - III

4 a) Give the terminology of surface roughness as per Indian standards **06**

b) In the measurement of surface roughness, heights of 20 successive peaks and troughs were measured from a datum and were 35,25,40,22,35,18,42,25,35,22,36,18,42,22,32,21,37,18,35,20 microns. If these measurements were obtained over a length of 20 mm, determine the C.L.A and R.M.S value of the rough surface. **06**

c) What is Thermocouple? Explain the laws of Thermocouples. **08**

UNIT - IV

5   a)   Define measurement. What are the significance of measurement system. **06**

     b)   With block diagram, explain generalized measurement system. **06**

     c)   Explain the following terms 1) Sensitivity 2) Hysteresis 3) Precision 4) Repeatability **08**

OR

6   a)   What is Error? Give the classification of Errors. **06**

     b)   Explain working principle and applications of elastic members. **06**

     c)   Explain the working principle of U tube manometer. **08**

UNIT - V

7   a)   Explain precision measuring instruments based on Laser Principles. **06**

     b)   Describe 3D Scanner and its applications. **06**

     c)   Explain the types, applications and constructional features of CMM. **08**

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