B037312(037)

B.Tech. (Third Semester) Examination
Nov.-Dec. 2021

AICTE (New Scheme)

(Mechanical Engg. Branch)

MECHANICAL MEASUREMENT and METROLOGY

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Part (a) of each question is compulsory. Internal choice are given, attempt for 16 marks from the questions.

Unit-I

1. (a) Define measurement and measuring instruments.   4

   (b) Draw a block diagram of generalized measurement system. Describe briefly.   8

(c) The following reading are taken of a certain physical length with micrometer screw :

1·41, 1·45, 1·63, 1·54, 1·49, 1·51, 1·60, 1·55, 1·47 and 1·65 mm.

Assuming that only random errors are present, calculate the arithmetic mean, the average deviation, standard deviation, variance and the probable error of the reading.　　　　　8

(d) Explain in brief linear variable differential transformer (LVDT).　　　　　8

Unit-II

2. (a) Explain absolute, gauge and vaccum pressures.　　　4

(b) Explain the working of wire type strain gauges.　　　8

(c) Write a note on temperature computation in strain gauge.　　　　　8

(d) Explain in brief total radiation pyrometers.　　　8

Unit-III

3. (a) List various method of flow measurement.　　　4

(b) Explain in brief hot wire anemometers　　　8

(c) With the help of neat sketch, explain briefly ultrasonic flow meter.　　　　　8

(d) What do you mean by data acquisition systems? Explain in brief signal transmission.　　　8

Unit-IV

4. (a) Explain briefly limits, fits and tolerances with an example.　　　　　4

(b) Write short notes on : (any **four**)　　　4×4=16

　(i) Gauge blocks

　(ii) Sine bar

　(iii) Micrometer

　(iv) Auto collimeter

　(v) Tool makers microscope

Unit-V

5. (a) Why comparators is used? What are its basic elements?   4

   (b) Explain two wire method of measuring screw threads.   8

   (c) Explain principle, working and use of comparator.   8

   (d) Explain brief optical comparator. What are its advantages and disadvantages?   8