Printed Pages – 5   Roll No. : ....

337356(37)

B. E. (Third Semester) Examination, April-May 2021

(New Scheme)

(Mech. & Production Engg. Branch)

MECHANICAL MEASUREMENT & METROLOGY

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.

Unit-I

1. (a) Define Transducer with example.   2

(b) Explain the functional elements of generalized measurement system with the help of suitable example.   7

(c) Explain different dynamic characteristics of a measurement system.   7

(d) In a test, temperature measurement were made 100 times with variations in apparatus and procedures. After applying the corrections the following results were obtained :

Temperature, °C	Frequencey of occurence
197	2
198	4
199	10
200	24
201	36
202	14
203	5
204	3
205	2

Calculate the following :   7

(i) Arithmetic mean

(ii) Average deviation

(iii) Standard deviation

(iv) Variance

(v) Probable error of one reading

(vi) Probable error of the mean

(vii) Standard deviation of the standard deviation

Unit-II

2. (a) Define Temperature.   2

(b) Explain the working of McLeod gauge with the help of neat sketch.   7

(c) Explain Bimetallic Thermometer with the help of neat sketch.   7

(d) Explain the working of "total radiation pyrometer" with the help of neat sketch. Write its merits and demerits.   7

Unit-III

3. (a) Define Vibration. What are the causes of vibration in machines?   2

(b) Describe ultrasonic flow meter and write its advantages and disadvantages.   7

(c) How the vibration measurement is done? Explain any one measuring instrument.   7

(d) What is DAS? Compare single and multi channel DAS.   7

Unit-IV

4. (a) Define End standard with example.   2

(b) What is Sine Bar? How it is used for angle measurement?   7

(c) Explain the following :

(i) Straightness

(ii) Flatness

(iii) Roundness

(iv) Circularity   7

(d) Describe Autocollimator with neat sketch.   7

Unit-V

5. (a) What is ACME thread?   2

(b) Explain the principle of Interferometry.   7

(c) What do you mean by Comparator? Explain Johansson Mikrokator with the help of neat sketch.   7

(d) Explain coordinate measuring machine and its applications.   7