

BTECH ,MAY –2014
MECHANICAL MEASUREMENTS & METROLOGY
Paper Code (BTME-503)
Paper Id. [A2130]

Time: 03 Hours

Maximum Marks: 60

Instruction to Candidates:

- 1) Section-A is compulsory consisting of Ten questions carrying Two marks each.
- 2) Section-B contains Five questions carrying Five marks each and students has to attempt any Four questions.
- 3) Section-C contains Three questions carrying Ten marks each and students has to attempt any two questions.

Section-A

Q.1

- a) Explain briefly the term “measurand”.
- b) Explain the term “Drift” using suitable examples.
- c) What are piezo-electric tansducers.
- d) What are the sources of random error?
- e) Explain RTD.
- f) Explain briefly the term “Precision Index”.
- g) How are standards of measurement classified?
- h) Give the method of vaccum measurement.
- i) What do you understand by term pico, tera, femto and giga?
- j) What are capicative pick ups.

Section-B

- Q.2 Discuss with the help of an example the basic and auxiliary functional elements of a measurement system.
- Q.3 What are zero, first and second order systems and their response to step, ramp and sinusoidal input signals?
- Q.4 Elaborate in brief the construction and working of optical and total radiation pyrometers.

Q.5 Discuss the method for measurement of tooth thickness and pitch of spur gears.

Q.6 The following 10 observations were recorded when measuring a temperature:

42.7, 41.7, 42, 42.8, 42.6, 41.2, 42.5, 41.8, 42, 41.9

Find: (i) Mean (ii) Standard Deviation
(iii) Average Deviation (iv) Variance

Section-C

Q.7 Elaborate in detail the construction and working of an electromagnetic flux meter and ionisation gauge.

Q.8 (a) State and explain the Gaussian error distribution law. How is it applied in interpreting the experimental results?

(b) What are the assumptions made for deriving the normal error distribution?

Q.9 Describe the underlying principle for the measurement of torque with a strain gauge torsion meter. Explain the procedure adopted to account for temperature compensation in such gauges.

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