

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3991

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

B.Tech.

(SEM IV) EVEN SEMESTER THEORY EXAMINATION,
2009-2010

MEASUREMENT & METROLOGY

Time : 3 Hours

Total Marks : 100

Note : (i) Attempt **ALL** the questions.

(ii) All questions carry **equal** marks.

1. Attempt **any four** parts : (4x5=20)

- (a) Explain Primary, Secondary and Tertiary types of measurements.
- (b) Explain the 'Desired' 'Modifying' and 'Interfering' inputs for an instrumentation system.
- (c) Explain following terms related to instruments :
 - (i) Repeatability.
 - (ii) Sensitivity.
- (d) Discuss the dynamic performance characteristics of first order instrument in case of ramp input.

- (e) Distinguish between :
- (i) Interfering and Modifying inputs.
 - (ii) Chaotic and Observational errors.
- (f) Discuss data transmission and signal conditioning.
2. Attempt *any two* parts : (2x10=20)
- (a) Describe the functioning of a stroboscope and explain how the speed of rotating shaft can be measured using a single pattern and multi pattern disc ?
 - (b) Discuss the construction and working of L.V.D.T.
 - (c) Discuss the principle of working of a McLeod Gauge with neat sketch along with its advantages and limitations.
3. Attempt *any two* parts : (2x10=20)
- (a) Describe with neat sketch the working of an optical pyrometer.
 - (b) Explain the construction and working of hydraulic and pneumatic load cells.
 - (c) Discuss the Taylor's principle of gauge design and give applications of Slip gauges and Universal Surface gauge.
4. Attempt *any two* parts : (2x10=20)
- (a) What are Interferometers ? Discuss the working of Michalson Interferometer.
 - (b) Why are comparators used in metrology ? Explain essential features of a "Johansson Mikrokator" with the help of neat sketch.
 - (c) What do you mean by straightness ? Describe any one method of measuring straightness of a surface.

5. Attempt *any two* parts :

- (a) Discuss different elements of surface texture with the help of sketch.
- (b) What is a profile projector ? Can it be used to check the profile of lion emblem usually embossed on a rupee coin ? If so, how ?
- (c) Name important elements of thread which are required to be measured in order to determine the accuracy of screw threads. Also list the instruments/apparatus required for measuring these elements.

- o O o -