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

PAPER ID : 4082 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. IV) THEORY EXAMINATION 2010-11

MEASUREMENTS, METROLOGY AND CONTROL

Time : 3 Hours *Total Marks : 100*

Note : (1) Attempt **all** questions.

(2) All questions carry equal marks

(3) Assume any data if necessary.

1. Attempt any **two** parts : **(10×2=20)**

(a) Define the following characteristics of a measuring instrument :

(i) Range

(ii) Drift

(iii) Sensitivity

(iv) Hysteresis

(b) Discuss the following consideration with respect to selection of a transducer.

(i) Mechnical suitability

(ii) Electrical suitability.

(c) Name the various method developed for signal transmission. Discuss any two of them in detail.

2. Attempt any **two** parts : **(10×2=20)**

(a) With a neat sketch describe the construction and working of a hydraulic load cell.

(b) Why temperature compensation is required in strain gauges ? Name different methods for temperature compensation and explain working of any one of them.

(c) Explain the construction and working of bourdon tube pressure transducer with the help of suitable figure.

3. Attempt any **two** parts : **(10×2=20)**

(a) Explain the working of sigma comparator with a neat sketch.

(b) Write the functions of basic units of comparator. Discuss various merits and demerits of mechanical comparators.

(c) Differertiate between the following :

(i) Standard and limit gauges

(ii) Fixed and Adjustable gauge.

4. Attempt any **two** parts : **(10×2=20)**

(a) Describe the constructional features of tool maker microscope. Discuss its application in metrology with suitable example.

(b) What is "macro geometrical errors" ? Discuss the working of spirit level to check straightness of a horizontal surface.

(c) Explain the principle of optical flat with neat sketch for measurement of flatness.

5. Attempt any **two** parts : **(10×2=20)**

(a) Write application of following controller components.

(i) Sensor

(ii) Amplification

(iii) Actuators

(b) Discuss the advantages and limitations of following

(i) Hydraulic controller

(ii) Pneumatic controller

(c) What do you understand by transfer function ? Derive the expression for transfer function for spring mass damper system. (Assume suitable data and condition if required)