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Printed Pages : 3

TME-404

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

PAPER ID : 4082 Roll No.

B. Tech.

(SEM. IV) EXAMINATION, 2007-08

MEASUREMENT METROLOGY & CONTROL

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt **all** questions. Each question carries **equal** marks.

1 Attempt any **two** parts of the following : **2×10**

(a) Explain in brief the types of errors and their sources of error.

(b) Explain the following fibre optic sensors with the help of line diagrams :

(i) Fibre optic position sensors.

(ii) Optical microphones.

(c) Explain the following recording devices with the aid of line diagrams :

(i) Galvanometeric recorders

(ii) Magnetic tape recorders.

Attempt any **two** parts of the following : **2×10**

(a) What is the use of micromanometers ? Explain the working of any one of the micromanometer.

(b) Explain the following devices for the measurement of the force :

(i) Pneumatic load cell.

(ii) Electric force devices.

(c) Explain the working of a luser seismograph with the help of a schematic diagram.

3 Answer any **four** parts of the following : 4×5

(a) Discuss the stands of a linear measurement.

(b) Define the limit, fit and tolerances.

(c) What are the measurements of an angle ? Write the name of the diffirent instruments used for this purpose.

(d) Discuss the working of sigma comparator in brief.

(e) Give the name of varipus gaugue's those are used for special purposes. Explain the working of a plug and ring gauges for tape work.

(f) Explain why two gauges are necessary to check a circular hole according to Taylor's principle.

4 Attempt any **four** parts of the following : 4×5

(a) Write the name of various methods available for flatness and describe any one of them in brief.

(b) Out line all the important steps for calibrating straight edge using wedge method.

(c) Discuss in brief working of a laser interferometer.

(d) What is meant by drunken thread ? What difficulties does it present in finding the pitch of the thread ?

(e) Explain with aid of a diagram working of a typical 'rolling' year tester.

(f) Define the following with respect to surface finish : (i) roughness (ii) waviness (iii) Lag (4) sampling length and (v) cut off.

5 Attempt any **two** of the following : **2×10**

(a) Explain the working of the open loop and the closed loop systems giving at least one example of each.

(b) Prove that of f(t) is of exponential order and if $\int_0^\infty f(t)dt$ exists (which means that $\int_0^\infty f(t)dt$ assumes a definite value) then

$$\int_0^\infty f(t)dt = \lim_{S \to 0} F(s)$$

where F(s) = L [f(t)].

(c) Write the advantages and disadvantages of hydraulic control system. Also explain it working in brief.