Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCME 4403

Seventh Semester Back Examination – 2014

MECHANICAL MEASUREMENT CONTROL

BRANCH : MECH

QUESTION CODE : L 208

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) What is the difference between error and accuracy ?

   (b) What are the transducers used for temperature measurement ?

   (c) What is the significance of Reynolds number in flow measurement ?

   (d) Define natural frequency and its importance in stability.

   (e) Write the Laplace Transform of an damped spring mass system.

   (f) Write the equation of a second order system of RLC circuit.

   (g) What is the difference between setting time and peak time ?

   (h) What is the difference between static and dynamic error ?

   (i) Define the calibration of a thermocouple.

   (j) What is an LVDT ?

2. (a) With a neat sketch explain the working of a very high temperature measuring device above 3000 ^{0}C. 5

   (b) What is the difference between Optical pyrometer and Radiation pyrometer ? 5

3. (a) How the flow is measured by using venture meter ? Derive the formulae and write down the assumptions. 5

   (b) When the flow is turbulent how the flow is measured by venture meter. 5

P.T.O.

4. Why Bode diagram is implemented to verify the frequency response of a system ? Explain with example of a second order system. 10

5. (a) Explain a polar plot with an example. 5

   (b) What do you mean by asymptote and centroid of a root locus curve. Explain with an example. 5

6. (a) Derive the overall transfer function of a feed back system. 5

   (b) What is the difference between open loop and close loop system ? 5

7. (a) Explain the working and formulae used for measuring high pressure above 1000 bar. 5

   (b) Enumerate the advantages and disadvantages of a venturi, orifice and nozzle flow meter. 5

8. Write short notes on : 2.5×4

   (a) Seebeck, Peltier and Thomson effect

   (b) Routhe's stability criteria

   (c) Phase margin and gain margin

   (d) Gage factor of a resistance strain gage.