R09

Code No: D9103

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
ADVANCE INSTRUMENTATION CONTROL SYSTEMS
(HEATING VENTILATION AND AIR CONDITIONING)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

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1.a) Define vibration. Explain how it is characterized, and list some of its harmful effects.
b) Explain the working of servo accelerometer with neat sketch.

2.a) With the help of a circuit diagram, explain the measurement of low pressure using ionization type gauge.
b) Explain the measurement of pressure using resistive transducer.

3.a) Describe the operation of electrical liquid level sensors.
b) Explain with the neat sketch cryogenic fuel level indicators.

4.a) Define gauge factor of a resistance strain gauge. Show that in a wire resistance strain gauge, the value of gauge factor can be attributed to the resistance change due to changes in gauge wire length, its cross sectional area, and resistivity. Under what conditions, does the following relation hold good?
$F = 1 + 2v$, where, F is the gauge factor and v is the Poisson's ratio.
b) Distinguish between bonded and unbonded type of resistance strain gauges.

5.a) What are the two different ways of providing temperature compensation in strain gauge circuit? Explain with the help of circuit diagrams.
b) Compare the Wheatstone bridge circuit and Ballast circuit/potentiometer circuit for strain measurement.

6.a) Explain the construction, working and applications of electronic tachometers.
b) Explain the measurement of pressure using thermocouple vacuum gauge.

7.a) Explain the working and applications of magnetic flow meters.
b) Explain the working principle and operation of micro-temperature measuring gauges.

8. Explain in detail the working of an air – conditioning controls like direct & reverse acting thermostats, temp transmitter with receiver controller with a neat sketch.

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