Printed Pages : 2

ECH-504

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

PAPER ID : 151505

Roll No.

B. Tech.

(SEM. V) (ODD SEM.) THEORY EXAMINATION, 2014-15

PROCESS INSTRUMENTATION

Time : **2** Hours] [Total Marks : **50**

1 Attempt any **FOUR** parts : **3x4=12**

a) Discuss the standards of measurement.

b) Write the relationship between sensitivity and range and discuss the disadvantage of very sensitive instruments.

c) Differentiate accuracy and uncertainty, precision and accuracy.

d) Briefly discuss different types of valves for flow control and measurement

e) Explain neleod guage.

f) An open manometer is used for measuring tank pressures. If the difference in level in the legs of the manometer is 2000 mmHg of mercury when the atmospheric pressure is 760 mm of mercury, what is the total tank pressure in kg/cm^2 absolute and guage?

2 Attempt any **TWO** parts : **7x2=14**

a) What is measurement? Discuss the classification and functions of instruments.

b) Discuss the dynamic accuracy of an instrument.

c) The temperature of a tempering bath falls at a rate of 0.5° C per sec. The thermometer used for measuring the temperature of the bath has a second order response with characteristic time of 6 sec. and a damping number of 10.

i) How many minutes does the thermometer lag behind the bath temperature?

ii) What is the maximum dynamic error?

3 Attempt any **TWO** parts : **6x2=12**

a) Explain the construction and working principle of thermocouple.

b) Elaborate the working principle of resistance thermometer and its applications.

c) Discuss the working principle of optical pyrometer with applications

4 Attempt any **TWO** parts : **6x2=12**

a) Describe the following with a neat sketch and working principle

i) Absolute- pressure vacuum guage

ii) Cold Cathode ionisation guage

b) Discuss the level measurement by capacitance with its working principle.

c) Discuss the working principle of the following with a neat sketch

i) Thermal type level meter.

ii) Rheo type viscometer.
