



Elen.3202

KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Food Engg.)
One-Time Re-examination-January-2018
2014 Admission VII Semester

Instrumentation and Process Control (2+1)

Marks: 50

Time: 2 hours

(10x1=10)

I Fill in the Blanks

- 1 A device which converts one form of physical variable into another is called a -----
- 2 Pneumatic transmission is generally operated on transmitted pressures of 0 to -----psi.
- 3 The temperature at which Fahrenheit and Centigrade scales coincide is -----
- 4 Thompson effect is a relation between the emf generated in a single homogeneous wire and the -----between the ends of the wire.
- 5 The resistance-temperature relationship for platinum elements is given by the-----equation.
- 6 -----Law of radiation states that any body in thermal equilibrium emits as much heat radiation as it receives at any given wavelength and temperature.
- 7 -----absorption spectrometers operate in the band of heat radiations.
- 8 If a gas is cooled at constant pressure to the-----point, condensation of vapour will begin.
- 9 The standard atmospheric pressure is taken as-----mm of Hg column at sea level and at 0^o C.
- 10 If the purpose of level measurement is to determine the weight of the liquid contained in a vessel, then-----measurement is preferable. (head/pressure)

II Write Short notes on any FIVE of the following

(5x2=10)

- 1 Discuss the advantages and limitations of using circular charts in recording variables.
- 2 List any four mechanical properties that must be considered in selection of a thermal well.
- 3 Draw the circuit diagram of a basic Wheatstone bridge which can be used as a resistance thermometer.
- 4 Outline the two basic principles used for construction of radiation temperature measuring devices.
- 5 Differentiate between absorption spectroscopy and emission spectroscopy.
- 6 Explain the operation of a metal-diaphragm pressure element.
- 7 Describe a float and tape method for direct measurement of liquid level.

III Answer any FIVE of the following.

(5x4=20)

- 1 Enumerate the procedural steps for analyzing a process and applying instrumentation.
- 2 Discuss the various factors which affect the speed of response of thermocouples.
- 3 With a circuit diagram, explain the working of a deflectional resistance thermometer.
- 4 With the help of a schematic diagram, explain an arrangement of a lens-type thermal radiation receiver.
- 5 Draw and explain a Calomel reference electrode used in pH measurement.
- 6 Explain the operation of a Thermionic-type ionization vacuum gauge.
- 7 Briefly explain a method for the measurement of interface level.

IV Answer any ONE of the following

(1x10=10)

- 1 With the help of a block schematic, elaborate on various instrumentation functions in plant organisation.
- 2 Summarise different types of absorption spectroscopy, clearly indicating their radiation band and applications.
