

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMEISTER END THEORY EXAMINATION, B.TECH. (D.T.) Degree Course 2017-18

Semester : VI (New Syllabus)
Course No. : DE-610

Academic Year : 2017-2018
Course Title : Instrumentation &
Process Control
Total Marks : 50
Time : 11.00 to 13.00 Hrs.

Credits : 2+1=3
Day & Date : Tuesday, 19.06.2018

Note : 1) Section "A" is Compulsory.
2) Solve **Any Five** questions from Section "B"
3) The use of scientific tables, charts and calculator is allowed in case of engineering courses.

SECTION - 'A'

Q.1 A) Choose the most appropriate answer from the options given below. (05)

i) Which of the following is correct

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|--|--|
| a) Absolute pressure = Gauge pressure + Atmospheric pressure | b) Gauge pressure = Absolute pressure + Atmospheric pressure |
| c) Atmospheric pressure = Absolute pressure + Gauge pressure | d) Absolute pressure = Gauge pressure - Atmospheric pressure |

ii) A venturimeter is used in industry to measure

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|----------------------------------|---------------------------------|
| a) velocity of flowing liquid | b) pressure of a flowing liquid |
| c) discharge of a flowing liquid | d) all of these |

iii) Reproducibility is the

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|--|---|
| a) degree of exactness | b) closeness of agreement among a number of consecutive measure |
| c) ability to respond to true value of a measured variable | d) none of the above |

iv) Thermistor is an electrical device made of

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|---|--|
| a) a semi-conductor with a low temperature coefficient of resistivity | b) a semi-conductor with a high temperature coefficient of resistivity |
| c) a copper | d) none of the above |

v) The first known automatic control system was

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|---------------------------------|----------------------------|
| a) flyball governor | b) heat exchanger |
| c) liquid tank level controller | d) water cooler controller |

B) Give short definitions.

(05)

- i) Transducer
- ii) Actuator
- iii) Indicating instruments
- iv) Static error
- v) Accuracy

(P.T.O.)

- Q.2 A) Replace the underlined word to make the statement technically correct. (05)
- i) Pneumatic proportional controllers with very high gain act as one position controllers.
 - ii) Bimetallic thermometers are based on changes in electrical resistance caused by varying temperature.
 - iii) Sensitivity may be defined as the difference between output and input of an instrument.
 - iv) Tangent galvanometer is a secondary electrical measuring instrument.
 - v) Active transducers need external power supply for their operation.
- B) Give one example of the following. (05)
- i) Analog transducer
 - ii) Indicating type electrical instrument
 - iii) Humidity measuring device
 - iv) Level indicator
 - v) Active transducer

SECTION – 'B'

- Q.3 Explain the principle of LVDT and explain its application in pressure and level measurement. (06)
- Q.4 Describe the automatic control of temperature of milk in heating section of a heat exchanger with a control loop diagram. (06)
- Q.5 Write the advantages and disadvantages of thermocouples. (06)
- Q.6
- a) List different sources of instrumental errors (02)
 - b) State the function of sight glass indicator (02)
 - b) Elaborate PID. (02)
- Q.7
- a) Discuss about rotameters with neat sketch. (03)
 - b) State the advantages of ultrasonic flow meters (03)
- Q.8
- a) Write different types of manometer. (02)
 - b) Define relative humidity and wet bulb temperature. (02)
 - c) Draw the block diagram of functional elements of an instrument system. (02)
- Q.9
- a) Write the basic principle of capacitive pressure transducers. (02)
 - b) Describe On/Off controller with an example. (04)
