

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B. TECH. (D.T.) DEGREE COURSE 2018-19**

Semester	: V (V Dean)	Academic Year	: 2018-2019
Course No.	: DE- 511	Course Title	: Instrumentation and Process Control
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Wednesday, 09/01/2019	Time	: 11.00 to 13.00 Hrs.

- Note :** 1) All questions from **Section 'A'** are compulsory.  
2) Solve **Any Three** questions from **Section 'B'**.  
3) Draw neat and well labelled diagram wherever necessary.

**SECTION – 'A'**

- Q. 1 A) Choose the most appropriate answer from the options given below. (05)
- i) Flow meter consisting of a tube with a short, narrow center section and widened, tapered ends is .....
    - a) Venturi meter
    - b) Variable area flow meter
    - c) Orifice meter
    - d) Flow nozzle meter
  - ii) A mercury barometer measures .....
    - a) Vacuum
    - b) Absolute pressure
    - c) Atmospheric pressure
    - d) Gauge pressure
  - iii) Rotameter is a .....
    - a) Drag force flow meter
    - b) Variable area flow meter
    - c) Variable head flow meter
    - d) Rotary propeller type flow meter
  - iv) The difference between measured variable and setpoint is known as .....
    - a) Precision
    - b) Drift
    - c) Error
    - d) Accuracy
  - v) Which type of controller is frequently used for the control of temperature in HTST pasteurizer?
    - a) PI
    - b) PD
    - c) PID
    - d) ON-OFF
- B) Define the following. (05)
- i) Accuracy
  - ii) Static characteristic
  - iii) Drift
  - iv) Hysteresis
  - v) Fidelity
- Q. 2 A) What do the following abbreviations indicate? (05)
- i) LVDT
  - ii) RTD
  - iii) PLC
  - iv) SCADA
  - v) PID

(P.T.O.)

- B) State whether the following statements are True or False. If false, rewrite the statement after making necessary corrections. (05)
- i) Volumetric expansion is the working principle of the bimetallic thermometers.
  - ii) Hair hygrometer is used for measuring of relative humidity.
  - iii) Pt 100 is pressure measuring device.
  - iv) Radiation pyrometer works on the principle of seeback effect.
  - v) The relative static error is ratio of absolute static error to the true value.

### SECTION – 'B'

- Q. 3 A) Describe different types of temperature measuring devices. (05)  
B) Give the basic requirements of transducers and classify them. (05)
- Q. 4 A) What are different modes of control and explain ON-OFF control in detail. (05)  
B) Explain working principle of rotameter with neat sketch. (05)
- Q. 5 A) Explain dynamic characteristics of measuring instruments. (03)  
B) Write the classification of Instruments. (03)  
C) Enumerate different pressure measuring devices. (04)
- Q. 6 A) Explain the functions of instruments and measurement systems. (03)  
B) Explain the controlling torque and damping torque in indicating instruments. (03)  
C) Explain the working principle of LVDT. (04)
- Q. 7 State and explain with neat sketch the elements of a generalized measurement system. (10)  
Discuss the elements of Bourdon tube pressure gauge in this context.

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