

SUB : Industrial Measurements (17434)

Date: 13/03 /2014

Course: SYEJ

Time: 9:30 pm to 12:30 pm

Marks: 100

Q1. A) Attempt any SIX

12 Marks

- List four elastic pressure transducer.
- Draw the block diagram of instrumentation system and label it.
- What is PT100? Give significance of PT and 100.
- Give two examples of variable head flow meters.
- List two methods for measuring humidity.
- Define NTC and PTC.
- Write the range of Reynolds number for laminar flow and turbulent flow.
- Define residual voltage in LVDT.

Q1. B) Attempt any TWO

08 Marks

- Sketch constructional diagram of the operation of electromagnetic flow meter State its two limitations .
- What is pressure calibration? State stepwise procedure to test the accuracy of a pressure gauge with dead weight tester.
- Draw a neat setup diagram to measure level of a liquid in a tank using a float and potentiometer. Also identify the primary sensor and secondary transducer in this setup.

Q.2 Attempt any FOUR

16 Marks

- Draw the constructional diagram and state applications of following transducers:
 - Bourdon Tube
 - Diaphragm
- Why is a rotameter called as a variable area flow meter? State the advantage of using a spherical float in rotameter .
- State the Seebeck effect and Peltier effect.
- What is the need of level measurement? Give classification of Level measurement methods with two examples for each
- Is piezoelectric transducer active or passive? Give reason. Also state the principle of operation o **piezoelectric transducer**.
- With the help of a neat labeled diagram describe the principle of operation of hair hygrometer.

Q.3 Attempt any FOUR

16 Marks

- Write two examples of
 - Active transducer**
 - Resistive transducer**
 - Inductive transducer**
 - Digital transducer**
- Define the term
 - Absolute pressure**
 - Gauge Pressure**
 - Vacuum Pressure**
 - Atmospheric Pressure**
- Give two advantages and two disadvantages of RADAR type level measurement method
- Compare RTD and thermistor on the basis of Temperature coefficient, Linearity, temperature range and cost
- Define the terms
 - Absolute Humidity**
 - Relative humidity**
- Calculate the output resistance of PT100 RTD for temperature values 30°C and 75°C .

Q.4 Attempt any FOUR

16 Marks

- Is ultrasonic level sensor contact type or non-contact type? Describe the method of level measurement using ultrasonic transducer
- Draw the input – output characteristics of LVDT. Why is it called as differential transducer?
- List different types of thermocouples, their material, range and sensitivity.
- State two advantages and two disadvantages of photoelectric pickup type speed measurement method.
- Mention different temperature scales and give conversion formulae. Convert 35°C in °F and °K.
- Sketch constructional diagram of inclined manometer. State its advantages and disadvantages.

Q5. Attempt any FOUR

16 Marks

- Describe the principle of operation of Doppler type ultrasonic flow meter used for flow measurement with a neat labeled sketch
- Why gas filled thermometer is usually filled with nitrogen gas? State the advantage of gas filled thermometer.
- List any eight points for selection of transducer.
- Differentiate between radiation type level measurement and capacitive type level measurement based on type of measurement, application, cost and accuracy.
- Which are non contact type tachometers? Compare them on the basis of any two factors.
- What is capsule? With the help of a neat labeled diagram describe how sensitivity can be increased by using a capsule for pressure measurement?

Q6. Attempt any FOUR

16 Marks

- Differentiate between analog and digital transducer on the basis of principle of operation, example, application and compatibility.
- State the advantages of using a well type manometer over U tube manometer for pressure measurement. Suggest a method for sensing the pressure of water flowing through a pipeline for obtaining the output as an electrical quantity.
- Differentiate between ventury and orifice plate type of flow meters on the basis of pressure recovery, construction, application and cost.
- A capacitive type level sensor is to be used for measuring the level of water (conducting) in a tank. With a neat labeled diagram, describe the construction of this sensor. Also state the reason for change in capacitance with change in level of water.
- What is thermistor? State types of thermistor. State any four advantages of thermistor.
- Convert 280 mm Hg pressure level in bars, psia, kilopascal and microns.