

Scheme-G

Sample Test Paper- I

Course Name :- Diploma in Electronics Engineering Group

Course Code :- EJ/EX/ET/EN/IS/IC/IE/IU/ED/EI

Semester :-Fourth

Subject Title :- Industrial Measurements

Marks :-25

17434

Time:-1 hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE of the following.

(9 Marks)

- a. Define
 - i.) Active transducer
 - ii) Passive Transducer
- b. List any three non elastic pressure transducers.
- c. Draw a neat diagram showing the construction of C type bourdon tube pressure transducer and label it.
- d. State the principle of operation of piezoelectric transducer.

Q2. Attempt any TWO of the following.

(8 Marks)

- a. Draw constructional diagram of U tube manometer, label it and write the working of U tube manometer.
- b. State the reason for connecting the secondary coils in series opposition in LVDT. What is residual voltage in LVDT.?
- c. Draw and label the neat diagram for pressure measurement using bourdon tube and LVDT.

Q3. Attempt any two of the following.

(8 Marks)

- a. Define Primary and secondary transducer. Give two examples of each.
- b. Is piezoelectric transducer active or passive? Give reason. Also state the principle of operation of piezoelectric transducer.
- c. Draw and label the block diagram of instrumentation system. State functions of each block.

Scheme-G

Sample Test Paper- II

Course Name :- Diploma in Electronics Engineering Group

Course Code :- EJ/EX/ET/EN/IS/IC/IE/IU/ED/EI

Semester :-Fourth

Subject Title :- Industrial Measurements

Marks :-25

17434

Time:-1 hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE of the following.

(9 Marks)

- a. State Seeback effect and peltier effect.
- b. Define NTC and PTC.
- c. Define Reynolds number. Write the range of Reynolds number for laminar flow and turbulent flow
- d. List any three types of thermocouple

Q2. Attempt any TWO of the following.

(8 Marks)

- a. Draw constructional diagram of the electromagnetic flow meter State its operating principle .
- b. List the types of pyrometer. How temperature can be measured by radiation type pyrometer?
- c. Draw the constructional diagram of orifice plate. What is vena contracta point in orifice plate?

Q3. Attempt any two of the following.

(8 Marks)

- a. What is PT100? Give significance of PT and 100.
- b. Is ultrasonic type level measurement is contact type or non-contact type? How level is measured using ultrasonic type level measurement system?
- c. With neat diagram show the construction of bimetallic thermometer. What causes a bimetallic strip to bend with respect to temperature?

Scheme-G

Sample Question Paper

Course Name :- Diploma in Electronics Engineering Group

Course Code :- EJ/EX/ET/EN/IS/IC/IE/IU/ED/EI

Semester :-Fourth

Subject Title :- Industrial Measurements

Marks :-100

17434

Time:-3 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. A) Attempt any SIX

(12 Marks)

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

Q1. B) Attempt any TWO

(08 Marks)

- a. Sketch constructional diagram of the operation of electromagnetic flow meter State its two limitations .
- b. What is pressure calibration? State stepwise procedure to test the accuracy of a pressure gauge with dead weight tester.
- c. 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.

Q2. Attempt any FOUR**(16 Marks)**

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

Q3. Attempt any FOUR**(16 Marks)**

- a. Write two examples of
 - i. Active transducer
 - ii. Resistive transducer
 - iii. Inductive transducer
 - iv. Digital transducer
- b. Define the term
 - i. Absolute pressure
 - ii. Gauge Pressure
 - iii. Vacuum Pressure
 - iv. Atmospheric Pressure
- c. Give two advantages and two disadvantages of RADAR type level measurement method
- d. Compare RTD and thermistor on the basis of Temperature coefficient, Linearity, temperature range and cost
- e. Define the terms
 - i. Absolute Humidity

- ii. Relative humidity
- f. Calculate the output resistance of PT100 RTD for temperature values 30°C and 75°C.

Q4. Attempt any FOUR

(16 Marks)

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

Q5. Attempt any FOUR

(16 Marks)

- a. Describe the principle of operation of Doppler type ultrasonic flow meter used for flow measurement with a neat labeled sketch.
- b. Why gas filled thermometer is usually filled with nitrogen gas? State the advantage of gas filled thermometer.
- c. List any eight points for selection of transducer.
- d. Differentiate between radiation type level measurement and capacitive type level measurement based on type of measurement, application, cost and accuracy.
- e. Which are non contact type tachometers? Compare them on the basis of any two factors.
- f. 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)

- a. Differentiate between analog and digital transducer on the basis of principle of operation, example, application and compatibility.

- b. 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.
- c. Differentiate between ventury and orifice plate type of flow meters on the basis of pressure recovery, construction, application and cost.
- d. 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.
- e. What is thermistor? State types of thermistor. State any four advantages of thermistor.
- f. Convert 280 mm Hg pressure level in bars, psia, kilopascal and microns.

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