Scheme – I

Sample Question Paper

Program Name : **Diploma in Digital Electronics Engineering**
Program Code : **DE**
Semester : **Third**
Course Title : **Industrial Instrumentation and Sensors**
Marks : **70** **Times: 3 Hrs.**

22332

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.

Q.1) Attempt any FIVE of the following. **10 Marks**

a) Define: i) Transducer ii) Sensor.

b) List any one example of following a) elastic pressure transducer b) Non-elastic pressure transducer

c) List any two advantages and disadvantages of rotameter.

d) State any two advantages, disadvantage of bimetallic thermometer.

e) Write the function of recorder and state its any two objectives.

f) List any two light sensors.

g) State seebeck effect and peltier effect

Q.2) Attempt any THREE of the following. **12 Marks**

a) Describe briefly the unbounded type strain gauge.

b) Explain the working principle of C Type bourdon tube.

c) Explain Construction of and working of RTD.

d) Identify the type of recorder used for plotting speed-torque characteristics of motor and

Q.3) Attempt any THREE of the following. **12 Marks**

a) Define the terms :i) Absolute pressure ii) Atmospheric pressure iii) Vacuum pressure iv) Gauge pressure

b) Compare thermistor and RTD any four point.

c) Mention different temperature scales and give conversion formulae. Convert 35^0C in ^{0}F and ^{0}K

d) List the factors that decide the configuration and subsystem of data acquisition system.

Q.4) Attempt any THREE of the following. 12 Marks

a) Explain the working principle of inclined tube manometer.

b) Draw constructional diagram of float type level meter.

c) Identify transducer for measurement of temperature in range 700 ^{0}C to 2000 ^{0}C and

d) Justify the selection of the transducer.

e) Suggest suitable voltage telemetry systems for direct transmission in a situation where frequency spectra of the signal are not suitable for transmission. Elaborate working of any one of them.

Q.5) Attempt any TWO of the following. 12 Marks

a) Draw a neat and labeled block diagram of instrumentation system and explain function of each block.

b) i) With help of neat block diagram explain working of general telemetry system.(04 M)

(ii) Compare Strip chart recorder and analog X-Y recorder. (4 points) (02 M)

c) i) Describe working principle of time difference type of ultrasonic type flow meter with suitable diagram. (4M)

ii) Draw neat diagram capacitive type level meter. (2M)

Q.6) Attempt any TWO of the following. 12 Marks

a) List the criteria for selection of a transducer for industrial application (any six).

b) A Newtonian fluid having viscosity of 0.38 N s/m^2 , specific gravity of 0.91 flows through 20mm diameter pipe with the velocity of 2.6 m/s. Calculate Reynold's Number. Based on Reynold's number state and justify the type of flow.

c) Describe the procedure to calibrate pressure gauge using dead weight tester.

Scheme – I

Sample Test Paper - I

Program Name : **Diploma in Digital Electronics Engineering**
Program Code : **DE**
Semester : **Third**
Course Title : **Industrial Instrumentation and Sensors**
Marks : **20**

22332

Times: 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.

Q.1 Attempt any FOUR. **08 Marks**

a) Define following transducers and state one example of each

1) Active Transducer 2) PassiveT

b) State the working principle of capacitive type proximity sensor

c) State working principle of elastic pressure transducer.

d) List four pressure measurement units.

e) State piezoelectric effect.

f) Explain the working principle of capsule.

Q.2 Attempt any THREE. **12 Marks**

a) Describe the procedure to measure pressure using diaphragm with strain gauge.

b) Convert 370 mm Hg pressure level in bars, psia, kilopascal and microns. .

c) List any four criteria used for selection of a transducer for industrial application.

d) Explain need of signal conditioning in process industry.

e) Describe in brief use of tactile sensors in process industry.

f) Draw a neat sketch of U-Tube manometer. State its principle of working.

Scheme – I

Sample Test Paper - II

Program Name : **Diploma in Digital Electronics Engineering**
Program Code : **DE**
Semester : **Third**
Course Title : **Industrial Instrumentation and Sensors**
Marks : **20**

22332

Times: 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.

Q.1 Attempt any FOUR. **08 Marks**

a) Define: a) laminar flow b) Turbulent flow.

b) Define : a) Relative Humidity b) Absolute Humidity

c) Explain need of cold junction compensation for temperature measurement using thermocouple.

d) List the factors that influence the choice of method used for the measurement of flow.

e) List any four material used to construct RTD.

f) Draw neat diagram capacitive type level meter

Q.2 Attempt any THREE. **12 Marks**

a) Explain with neat diagram ultrasonic type level meter.

b) Compare RTD and thermistor on the basis of Temperature coefficient, Linearity, Temperature range and cost.

c) Describe the use of proximity sensor for distance measurement.

d) Describe the use of gas filled type of thermometer for temperature measurement.

e) 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.

f) Explain operation of dry and wet bulb method of humidity measurement.