Question bank – Instrumentation and Process Control

Chapter – 1

INSTRUMENT

2 marks

1. What is static characteristic of an instrument? Name any two.

2. What is drift in an instrument?

3. What do you mean by instrument?

4. What is the function of primary element of an instrument?

5. What are function of instruments?

6. What is sensitivity of an instrument?

5 mark

1. What are the static characteristic of an instrument?

2. Describe the elements of an instrument along with a block diagram showing the order in which they are found in an instrument.

10 mark

1. Discuss the function of an instrument.

Chapter – 2

MEASUREMENT OF CHARACTERISTIC

2 mark

1. Define polarimeter

2. Why is a hydrometer used? mention the principle on which it works.

3. What is the unit to measure the density of petroleum product?

5 mark

1. Write principle and operation of hydrometer.
2. Escribe measurement of refractive index by polarimeter.
3. Describe the measurement of refractive index by a refractometer.
4. Explain the construction and working of a spectrophotometer.

10 mark

1. Explain the principle of ultraviolet spectroscopy.
2. Describe measurement of viscosity by Redwood viscometer.
3. Explain the measurement of viscosity by falling sphere viscometer.

Chapter – 3

LIQUID LEVEL MEASUREMENT

2 mark

1. Write the float type liquid level indicator.
2. What are the instruments used for open and closed vessels?

5 mark

1. Write the principle of pressure gauge method of liquid level measurement.
2. Explain working of level measurement used for open vessel.
3. Describe the construction and working of float-type level indicator with neat sketch.

10 mark

1. Explain the construction and operation of a displacer level detector.
2. Write down the construction and working principle of Hook type level indicators.

Chapter – 4

pH & CONDUCTIVITY MEASUREMENT

2 marks

1. What is absorbance?

2. Write pH range of acid, alkaline and neutral solution.

3. Define pH .

4. What are the different types of glass electrodes used for pH measurement?

5 marks

1. Explain Nernst relationship with respect to pH measurement.

2. Describe the measurement of pH ?

10 marks

1. Explain the method of pH measurement in a pH meter.

2. Describe working of an instrument to measure electrical conductivity.

chapter – 5

TEMPERATURE MEASUREMENT

2 mark

1. What is temperature?

2. Name any two thermocouples with their temperature range.

3. What are the liquids used in the vapour pressure thermometer?

4. What is Pyrometry?

5 mark

1. Explain Seebeck effect.

2. Describe the temperature measurement on electric phenomena in thermocouple.

3. What are different scale s used for measurement of temperature? mention the ice poin and steam point for each of them.

4. Mention the instrument used for measurement of temperature.

5. Write different temperature scale and their relationship.

10 mark

1. Write the construction and operation of a thermocouple.

2. Describe working of a optical pyrometer with neat diagram.

3. Write the principle and working of resistance temperature detector?

4. Explain the working principle of mercury-in glass thermometer. why the scale calibration may not be linear in such kind of thermometer and what are the limitations of it?

chapter – 6

PRESSURE MEASUREMENT

2 marks

1. Convert 10 kilopascal to mm of mercury Pressure .

2. What is angularity in a Bourdon tube pressure gauge?

3. Define Pressure and write its unit.

4. What is gauge pressure ?

5. What is absolute pressure ?

6. What is vacuum or differential pressure ?

7. Write the advantages of diaphragm gauge.

8. Write the disadvantages of diaphragm gauge.

9. Write the advantages of differential bellows gauge.

10. Write the disadvantages of bellows gauge.

11. Write the advantages of Mcleod gauge.

12. Write the application of ionisation gauge.

5 mark

1. Write the advantages and disadvantages of a bellow type pressure gauge.

2. Explain the relation between absolute, gauge and barometric pressure.

3. Explain the construction and operation of a C-type Bourdon tube pressure gauge.

4. Write the advantages and disadvantages of Bourdon tube pressure gauge.

5. Write the operation of metallic diaphragm gauge.

6. Write the operation of slack diaphragm gauge.

10 marks

1. Explain the principle and working of ionization gauge with diagram.

2. Explain the construction and operation of a differential bellow gauge with diagram.

3. Explain the construction and working of Mcleod gauge with neat diagram.

4. Explain the principle and operation of pirani gauge with diagram.

chapter - 7

AUTOMATIC CONTROLLER

2 mark

1. Write the advantages of automatic control system.

2. What is sensor in a control system.

3. What is the function of controller in a control system?

4. What is the final control element of a control system?

5. What is controlled variable?

6. What is set point?

7. What is manipulated variable?

8. What is disturbances?

9. What is range in control system?

10. What is span in control system?

11. What is gain in a control system?

12. Classify process control system.

13. Write the advantages of open loop control system.

14. Write the disadvantages of open loop control system.

15. Write the application of automatic control system.

16. Define transfer function.

5 mark

1. Explain different component of a flow control system
2. Explain the control system in a liquid level tank.
3. Describe a block diagram with an example
4. Write the advantages and disadvantages of a closed loop control system.
5. Write a note on sensor and transmitter used in a control system.
6. Explain how the control system ensure safety in plant operation.
7. Write short notes on computer aided measurement and control.
8. Write short notes on PLC.

10 mark

1. Explain the operation of a feed back control system with flow diagram.
2. Explain the control system in a heat exchanger with diagram.
3. Explain the transfer function of a control system.
4. Explain the working of automatic control system.
5. Explain elementary transfer function for a first order system.