

Code No: 07A50806

R07**Set No. 2**

III B.Tech I Semester Examinations, May 2011
PROCESS INSTRUMENTATION
Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) Explain in detail about the enlarged-leg mercury manometer differential-pressure element with a neat diagram.
 (b) Explain with a neat diagram, the working of bellows differential-pressure meter. [8+8]
2. (a) What is the principle involved in mercury-in-glass thermometer.
 (b) Explain in detail about the working of mercury-in-glass thermometer. [6+10]
3. Explain the following effects:
 - (a) Seebeck effect
 - (b) Peltier effect
 - (c) Thomson effect
 - (d) Joule heating effect. [4+4+4+4]
4. (a) Define about radiation.
 (b) What is the importance of pyrometer.
 (c) Mention the various types of radiation pyrometers and explain in detail about the working of any one pyrometer. [2+2+12]
5. Explain the working of liquid-level method of measuring specific gravity or density. [16]
6. (a) Differentiate between strip and circular chart recording chart.
 (b) Differentiate between circular chart recorders and multiple-point recorders. [8+8]
7. Write short notes on:
 - (a) V-notch or Thomson weir
 - (b) trapezoidal notch or cipoletti weir.
 - (c) open channel meters
 - (d) open nozzles. [4+4+4+4]
8. (a) What is meant by spectroscopy?
 (b) Explain the working of absorption spectrum of sodium. [4+12]

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Set No. 4

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PROCESS INSTRUMENTATION
Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the principle and working of Thermopile. [16]
2. Explain in detail the working of gas chromatographic column. [16]
3. (a) What are the circular recording chart.
(b) Explain in detail about the different styles of recording charts. [8+8]
4. (a) What are the characteristics of lead wires?
(b) What are the various methods of selecting lead wires. [4+12]
5. Write short notes on the following:
(a) self-operated instrument
(b) power-operated instrument
(c) automatic instrument
(d) manual instrument. [4+4+4+4]
6. Explain the following:
(a) Bell-differential-pressure meter
(b) Bell-differential pressure element. [8+8]
7. (a) Differentiate between air-trap system and diaphragm-box system for liquid-level measurement.
(b) Differentiate between bubbler- system and diaphragm-box system for liquid-level measurement. [8+8]
8. (a) Define quantity meters.
(b) What are the two basic kinds of quantity meters.
(c) Give the equation of flow rate in volumetric meters. [5+8+3]

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R07**Set No. 1**

III B.Tech I Semester Examinations, May 2011
PROCESS INSTRUMENTATION
Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain in detail about the color measurement by spectrometers. [16]
2. Explain in detail about the accuracy and speed of response of an industrial thermometer. [16]
3. (a) Write in detail about the response of mechanical pressure gages.
(b) Draw and explain in detail about the response of pressure gages. [8+8]
4. (a) Define head flow meters and area flow meters.
(b) What are the various factors in selecting proper-piping arrangement? [4+12]
5. (a) What is the purpose of signaling instruments?
(b) What are the common signaling systems and explain them. [4+12]
6. Explain about the influence of speed of response of modern resistance- thermometer bulbs. [16]
7. (a) Why lead wires are preferred as connecting wires in thermocouples. Explain.
(b) Explain the radiation effect during thermocouple installations. [8+8]
8. (a) Write the relation between head and float displacement in a manometer.
(b) Explain the working of a differential pressure manometer for measuring liquid level with static balance. [6+10]

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R07**Set No. 3**

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PROCESS INSTRUMENTATION
Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss in detail about the control center.
(b) Explain about the central layout of control center and plant. [8+8]
2. Explain the principle and working of Wheatstone bridge. [16]
3. Explain with a neat sketch and equation for pressure difference in the following manometers.
(a) U-tube manometer
(b) Inclined Manometer
(c) Differential manometer
(d) Inverted U-tube Manometer [4+4+4+4]
4. (a) Define a bimetal.
(b) Explain in detail the working of an industrial bimetallic thermometer. [8+8]
5. Explain about the working of :
(a) industrial thermocouple.
(b) tube-type thermocouple. [8+8]
6. Explain the working of conveyor-flow meter. [16]
7. (a) Explain the various methods for composition analysis.
(b) What are the various positive and negative methods for the composition analysis. [8+8]
8. Write notes on the following:
(a) Relation between head and float displacement.
(b) Factors that cause variable errors in differential-pressure measurement of liquid. [8+8]
