

Code No: 07A41002

R07**Set No. 2****II B.Tech II Semester Examinations, December 2010****INDUSTRIAL INSTRUMENTATION****Instrumentation And Control Engineering****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define linear measurement. List the linear measuring instruments according to their accuracy.
(b) What are comparators? Write a short note on classification of comparators. [8+8]
2. (a) Describe the working principle of pirani gauge.
(b) Describe the method of measurement of differential pressure using an inductive transducer. [8+8]
3. (a) What is a hot wire anemometer? Describe its construction and principle of working with neat sketch.
(b) What are the advantages and disadvantages of venturimeter. [12+4]
4. (a) How the rotating gyroscope meter is used to measure the mass flow rate of fluids?
(b) Differentiate between vibrating gyroscope meter and rotating gyroscope meter used to measure mass flow ? [8+8]
5. (a) What are the advantages of piezoelectric type accelerometer?
(b) Name the different vibration sensing systems used in practice. Explain Any one such system for the measurement of vibration. [8+8]
6. (a) How are real - world objects are characterized by emittance, reflectance and transmittance and how are they enter related ?
(b) How the radiation meter, emittance calibration is set for a desired range of temperature ? [16]
7. Explain the construction and working of a pendulum scale. Justify that this scale of multilever type with some differences. Elaborate the differences. [16]
8. Explain how resistive transducers can be used for measurement and control of relative humidity. Describe its advantages and disadvantages. [16]

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R07**Set No. 4****II B.Tech II Semester Examinations, December 2010****INDUSTRIAL INSTRUMENTATION****Instrumentation And Control Engineering****Time: 3 hours****Max Marks: 80**

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1. (a) Liquid column manometers are treated as standards for pressure and Differential pressure measurements. Why? Explain with suitable examples.
(b) Explain how resistance strain gauges are used in pressure measurement. [8+8]
2. Describe the construction of a pitot tube and show how it can be used for measurement of velocity of a fluid flowing in a pipe. Describe its advantages and disadvantages. [16]
3. (a) Sketch explain the construction and working of buoyancy effect densitometer used to find the density of fluid ?
(b) How the principle of change in frequency with change in density of fluid is used to find the density ? [16]
4. Describe the following types of capacitive methods used for level measurement.
(a) Variable area method
(b) Variable Dielectric constant method. [8+8]
5. What are mechanical tachometers? Explain with examples. Describe the disadvantages of mechanical tachometers. [16]
6. (a) State the principle of vernier instrument. Explain briefly the construction and use of vernier caliper with a neat sketch.
(b) Describe the relative merits and demerits of micrometers and vernier callipers. [8+8]
7. (a) What are the various methods used to detect the infrared radiation and mention the advantages and limitations of them ?
(b) Explain the working mechanism of an evaporated nickel - film bolometer used to detect infrared radiation. [16]
8. (a) What are Proving rings? Explain how they can be used for measurement of force using a vibrating reed and a micrometer.
(b) What are load cells? Explain the working of a load cell using strain gauges. [8+8]

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R07**Set No. 1****II B.Tech II Semester Examinations, December 2010****INDUSTRIAL INSTRUMENTATION****Instrumentation And Control Engineering****Time: 3 hours****Max Marks: 80**

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1. (a) What is tachogenerator. Explain AC & DC tachogenerators for rotary velocity measurement.
(b) Explain ignition type tachometer? [8+8]
2. Describe the method of measurement of density with a hydrometer. Explain in details the method used if density is to be continuously monitored and controlled using a Hydrometer. [16]
3. Describe the construction working and theory of Kundsén gauge for measurement of vacuum. List their advantages and disadvantages. [16]
4. (a) Explain how Doppler effect is used for measurement of flow velocities in ultrasonic flow meters.
(b) What are the advantages and disadvantages of ultrasonic flowmeter. [10+6]
5. (a) How the standard gravimetric hygrometer functions for the measurement of humidity?
(b) Differentiate between the dry - bulb and wet bulb thermometers? [16]
6. Describe in brief the construction and working of a mechanical comparator with neat sketch, advantages and disadvantages of mechanical comparator. [16]
7. (a) Describe the principle of disappearance of heated filament in the measurement of temperature?
(b) Explain with a neat sketch the working of disappearing - filament optical pyrometer. [16]
8. Explain Bouyancy effects and describe how they are corrected for in analytical balances. [16]

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R07**Set No. 3****II B.Tech II Semester Examinations, December 2010****INDUSTRIAL INSTRUMENTATION****Instrumentation And Control Engineering****Time: 3 hours****Max Marks: 80**

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1. (a) What is positive displacement meter and how can this principle is used in the measurement of flow ?
(b) Describe the construction and working of turbine type flow meter ? [8+8]
2. What is tachometer? Explain the construction and working of an a. c. tachometer generator. Describe its limitations. [16]
3. (a) What are the problems in the measurement with effective / translucent targets?
(b) Sketch and explain the basic photo detector circuit of photo - diode? [8+8]
4. (a) Describe different sources of errors in U-tube manometer and how Corrections can be applied to minimize these errors.
(b) Explain how sensitivity can be increased by using inclined tube manometer. Describe its construction, advantages and limitations. [8+8]
5. Explain how elastic sensing elements can be used for measurement of force. Describe their working, advantages and limitations. Cite suitable examples. [16]
6. (a) Explain the use of protractors and angle gauge blocks for measurement of angle.
(b) Sketch and explain the working of a polar planimeter for the measurement of areas of irregular diagrams. [8+8]
7. (a) How the acoustic - impedance signal is used in the measurement of density ?
(b) Sketch and explain the construction and working of fluid - density measurement by reduction method ? [8+8]
8. (a) Explain with a block diagram the method of measurement of time interval.
(b) How the digital counter timer is used for the measurement of phase angle between two signals ? [8+8]
