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B.TECH.**THEORY EXAMINATION (SEM–VI) 2016-17****INDUSTRIAL INSTRUMENTATION****Time : 3 Hours****Max. Marks : 100****SECTION-A****1 Attempt the following:****(10×2=20)**

- a) Industrial symbols and standards.
- b) Null balance method.
- c) Temperature measurements.
- d) Radiation thermometers.
- e) Different type of manometers.
- f) Thermocouple gauge.
- g) Drag force flow meters.
- h) Chemical Reaction Method.
- i) Industrial viscosity meter.
- j) Float type gauge.

SECTION-B**2 Attempt any five of the following:****(10×5=50)**

- a) Enlist the various types of strain gauges and explain any one of them with suitable example.
- b) Give the working principle of LVDT with a neat sketch.
- c) What is humidity measurement? Explain about distillation method. Write its merits and demerits.
- d) Illustrate about the construction of resistance thermometer (pirani) gage where the functions of heating and temperature measurement are combined in a single element.
- e) A power radiated from a hot piece of metal was measured by radiation pyrometer and the temp was determined as 80 °C. Assuming the surface of emissivity of 0.70 later it was found that the accurate volume of emissivity was 0.65. Find the error in temperature determination.
- f) Enlist the different types of thermal expansion methods. Explain any one of them with a neat sketch.
- g) Name some of the piezoelectric crystals. Discuss about the piezoelectric transducer for weight measurement.
- h) How load cell method is used for weight measurement? Explain the working of hydraulic load cell with neat diagram.

SECTION-C**Attempt any two of the following:****(15×2=30)**

3. a) Water (density: 1000 kgm⁻³) stored in a cylindrical drum of diameter 1 m is emptied through a horizontal pipe of diameter 0.08 m. A pitot-static tube is placed inside the pipe facing the flow. At the time when the difference between the stagnation and static pressure measured by the pitot-static tube is 9kPa. Find the rate of reduction in water level in the drum.

- b) What is manometer? Enlist the different type of manometer and explain inclined type manometer with proper diagram.

4. a) A U-tube manometer is used to measure a differential air pressure with a fluid of density 400 Kg/m. The air is at 280 kPa and 27 °C. Calculate the differential pressure if the difference in the height of the fluid in the manometer is 110 mm. Express in units of kPa.
- b) Elaborate the working principle of rotameter with a neat sketch.
5. Write short notes on the following:
- a) Describe about the electrical method of moisture measurement.
- b) Elucidate about the chemical reaction method for the measurement of moisture.