

Printed Pages – 5

Roll No. ....

**328355(28)**

**B. E. (Third Semester) Examination, April-May 2021**

**(New Scheme)**

**(ET & T Branch)**

**INDUSTRIAL INSTRUMENTATION**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Part (a) of each question is compulsory and carries 2 marks. Part (b), (c) & (d) carry 7 marks. Attempt any two parts from (b), (c) and (d).***

**Unit-I**

**1. (a) State one merit and demerit of LCD over LED.**

[ 2 ]

- (b) What is the role of variable manipulation element in generalized measurement system and also explain generalized measurement system with help of its block diagram.
- (c) With the help of block diagram, explain the working of Digital Storage Oscilloscope.
- (d) Explain how the phase and frequency measurements can be made with the use of CRO.

#### Unit-II

2. (a) What do you mean by Power rating of Potentiometers.
- (b) What are requirements of materials for Strain Gauge. A resistance strain gauge experiences 1% change in resistance when subjected to uniaxial strain of  $5000 \mu$  -strain. Determine the Gauge factor. What would be sense and magnitude of error if a value of 1.9 is assumed for the Gauge factor.
- (c) Define the following :
- (i) Backlash

328355(28)

[ 3 ]

- (ii) Max Overshoot
  - (iii) Resolution
  - (iv) Tolerance
- (d) A pressure measuring instrument uses of capacitive transducer having a space of 4 mm between its Diaphragms. A pressure of  $600 \text{ kN/m}^2$  produces an average deflection of 0.3 mm of the diaphragm of transducer. The transducer which has a capacitance of 300 Pf before application of pressure and is connected in an oscillator having a frequency of 100 kHz determine the change in frequency of oscillator after the pressure is applied to the transducer.

#### Unit-III

3. (a) Define Absolute Humidity.
- (b) With help of neat sketch, explain working of measurement of liquid level using resistive method. What are its advantages & disadvantages?
- (c) Explain the working of Stroboscope. A disc having

328355(28)

PTO

[ 4 ]

an 8 pattern point is mounted on motor shaft. The number of flashes projected on the disc by a stroboscope is 6000 per minute. Determine the speed of the machine when the disc appears to rotate in backward direction at 20 rpm.

(d) Write short notes on Seismic Transducer.

#### Unit-IV

4. (a) State two difference between Resistance thermometer and Thermistor.

(b) With help of neat sketch explain the working of Bimetallic Thermometer.

(c) The right limb of simple U tube manometer containing mercury is open to atmosphere and the left limb is connected to a pipe through which flows a liquid of specific gravity 0.8. Make calculations for the vacuum pressure in the pipe if the difference of mercury level in two limbs is 30 cm. and the level of fluid in left limb is 10 cm below the centre of pipe.

(d) With help of neat sketch explain the working of Optical pyrometer.

328355(28)

[ 5 ]

#### Unit-V

5. (a) Define Reynold number for flow measurement.

(b) With help of neat sketch explain the working of Electromagnetic flow meter.

(c) A venturimeter is of size 5 cm × 2.5 cm size (pipe × throat) to be used to measure a maximum flow rate of water of 3.5 kg/s at 20° dynamic viscosity 0.001 Ns/m<sup>2</sup> The throat Reynolds number is to be at least 10<sup>5</sup> at these flow conditions. Discharge coefficient is 0.9752. The upper scale limit is to be selected to correspond to the maximum flow rate. Determine the maximum range of differential pressure.

(d) Write short notes on Photovoltaic Transducer.

100]

328355(28)