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Total No. of Questions : 9] [Total No. of Pages : 4

24358

**B.Tech. (ME) 6th Semester (Supplementary)
Examination, July-2021
(F Scheme)**

**MEASUREMENT AND INSTRUMENTATION
Paper-ME-310-F**

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Attempt any *one* question from each Section.
Q. No. 1 is compulsory.

Compulsory Question

1. (a) Explain the digital transducers.
- (b) Clearly the difference between 'Threshold and Resolution'.
- (c) How are tachometers classified ?
- (d) What are Thermistors ? What are their advantages ? 5×4=20

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Section-A

2. (a) Draw a block diagram representation of a generalized measurement system. Identify the various elements and point out the function performed by each components.
- (b) State the advantages and disadvantages of mechanical instruments over electrical/ electronic instruments. 10,10
3. (a) A first-order system having a time constant of 0.1 second is used to measure a signal prescribed by the relation : $I_i = 3 \sin 2t + 0.4 \cos 10t$. Develop an expression for the corresponding output.
- (b) Explain the term 'Drift' using suitable examples. 14,6

Section-B

4. A linear resistance potentiometer is 50 mm long and is uniformly wound with a wire having a resistance of 10,000 ohms. Under normal conditions, the slider is at the centre of the potentiometer.

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- (a) Find the linear displacements when the resistances of the potentiometer are measured by a Wheatstone bridge for two cases are :
 - (i) 3,800 ohms
 - (ii) 7,500 ohms
- (b) If it is possible to measure a minimum value of 12 ohms resistance with the above arrangement, find the resolution of the potentiometer in mm. 20
- 5. (a) What is a piezoelectric transducer ? List the advantages and disadvantages of piezoelectric transducers.
- (b) What is the principle on which a capacitive transducer works ? Also mention advantages and disadvantages of capacitive transducers. 10,10

Section-C

- 6. (a) What is 'Torque' ? How can it be measured ? List the different methods.
- (b) Explain the transducers which are used for the measurement of force. 10,10

- 7. Describe briefly the construction and working of strain gauge load cell. State its fields of application as well. 20

Section-D

- 8. (a) What are the different factors which influence the choice of method used for the measurement of flow ?
- (b) How are very high pressures measured ? Explain briefly with a neat sketch the construction and working of a Baridgman gauge used for measuring high pressures. 10,10
- 9. (a) Write the precautions which should be taken while making temperature measurements.
- (b) Explain with a neat diagram the construction and working of a thermoelectric pyrometer. 10,10