T.Y. Diploma : Sem. V
[ME/MH/MI/PG/PT]

Measurement & Control

Time: 3 Hrs.] Prelim Question Paper **[Marks : 100**

Instructions : (1) All questions are compulsory.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.

1. Attempt any **TEN** from the following : **[20]**

(a) Define the term, 'Threshold', 'Resolution', 'Repeatability' and 'Reproducibility'.
(b) Compare hydraulic and electronic control systems.
(c) List the advantages and disadvantages of capacitive transducers.
(d) How pressure is measured by piezoelectric transducer? Explain.
(e) Draw a neat sketch of linear Potentiometer for displacement measurement, explain its working.
(f) State and explain working principle of potentiometer.
(g) Define sensitivity drift and zero drift. What factors can cause sensitivity drift and zero drift in instrument characteristics?
(h) What is transducer ? Classify the transducer.
(i) What are active and passive transducers? Give two examples of each.
(j) Draw the block diagram of a feedback control system and describe it in brief.
(k) What are different types of errors in measurement system? Give classification.
(l) Define intensity of sound & sound pressure.
(m) Explain working of any one displacement transducer.

2. Attempt any **FOUR** the following : **[16]**

(a) Explain working principle of temperature measuring instrument for temperature upto 2200°C.
(b) Explain with neat sketch working of Mc Leod gauge.
(c) Draw the characteristics of LVDT and state its significance.
(d) Explain the working of vortex-type flow meter with a net sketch and state its advantages.
(e) Explain strain measurement method using load cell with a neat sketch.
(f) Explain with neat sketch working principle of LVDT.

3. Attempt any **FOUR** of the following : **[16]**

(a) Explain with neat sketch 'Thermal conductivity gauge'.
(b) Explain construction and working of RTD.
(c) What is psychrometer? Explain its use for measuring humidity with a neat sketch.
(d) Explain construction and working of photo-electric pressure transducer.
(e) Distinguish between Non-electrical methods and Electrical methods for temperature measurements.
(f) Differentiate between deflection and null-output type measurement instruments and give its appropriate examples.

4. Attempt any **FOUR** of the following : **[16]**

(a) List various advantages of electromagnetic flowmeter.
(b) Draw neat sketch of Ultrasonic Flow Meter and explain how flow is measured by it.
(c) Explain with a neat sketch, working of optical pyrometer for temperature measurement.
(d) Explain with neat sketch how Load Cell is used for strain measurement.

(e) Explain float and resistance type instrument used for liquid level measurement.
(f) Explain with a neat sketch, working of float type gauge for measuring liquid level of tank.

5. Attempt any **FOUR** of the following: **[16]**
(a) Explain the working of Rotameter with the help of neat diagram.
(b) Explain control system used for motor speed control.
(c) With a neat sketch, explain working of PID control system.
(d) How flow is measured by Hot wire Anemometer?
(e) Explain with a neat sketch, working of Bourdon-Tube pressure gauge.
(f) Explain bonded type of strain gauge with neat sketch.

6. Attempt any **FOUR** of the following: **[16]**
(a) Explain with neat sketch the working of capacitive transducer for liquid level measurement.
(b) Write the principle of turbine meter with two applications.
(c) A pressure gauge having a range of 500 kN/m^2 has a guaranteed accuracy of 1.5% of full scale deflection. What would be the possible readings for a true value of 95 kN/m^2 ?
(d) What are the different control actions ? State its significance.
(e) Explain principle of eddy current dynamometer with neat sketch.
(f) Explain servo motor mechanism with neat sketch. State its application.

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T Y Diploma Sem-V: Paper Discussion Schedule

Branches	Date	Day	Timing	Centres
Mechanical Group	8 Nov. 2018	Thursday	9 a.m. to 11 a.m.	Dadar, Kalyan
	8 Nov. 2018	Thursday	12 noon to 2 p.m.	Thane