

- 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 and resolution.
  - (b) Draw the block diagram of a feedback control system?
  - (c) Define the term range and span.
  - (d) What is function of transducer? Differentiate between active and passive transducer.
  - (e) What is thermoelectric effect?
  - (f) Which instrument is used for measuring temperature of 1400 °C furnace and exhaust valve of engine?
  - (g) Define sensitivity drift and zero drift?
  - (h) List any four low pressure measuring instrument. State its range.
  - (i) Define overshoot and measuring lag.
  - (j) Describe the significance of measurement.
  - (k) Define span and range.
  - (l) State advantages of stroboscope.
  - (m) Define control system? State any two examples of control system.
2. Attempt any **FOUR** the following : [16]
  - (a) What are different types of errors in measurement system? Give classification.
  - (b) Explain the working of bimetallic thermometer with the help of a neat sketch.
  - (c) Differentiate between accuracy and precision with suitable example.
  - (d) Explain the components of an automatic domestic air conditioning system, with the help of a block diagram.
  - (e) Explain with neat sketch working of McLeod gauge.
  - (f) Explain the working of vortex-type flow meter with a neat sketch and state its advantages.
3. Attempt any **FOUR** of the following : [16]
  - (a) Write the specification for displacement transducer.
  - (b) Explain with neat sketch photoelectric pressure transducer.
  - (c) Explain construction and working of bimetallic thermometer.
  - (d) List two advantages and two limitations of resistance thermometer.
  - (e) Explain the working of Hot-wire Anemometer for the measurement of rate of fluid flow also mention its limitations.
  - (f) What is psychrometer? Explain its use for measuring humidity with a neat sketch.
4. Attempt any **FOUR** of the following : [16]
  - (a) Draw neat sketch of Rotameter and explain its working.
  - (b) A resistance wire strain gauge with a gauge factor  $F = 2.1$  is bonded to a steel member subjected to a stress of  $100 \text{ mN/m}^2$ . Calculate the percentage change in the value of gauge resistance due to applied stress. For steel  $E = 2006 \text{ N/m}^2$ .
  - (c) Explain the feed forward control system with the help of a neat sketch.
  - (d) Explain sound measurement using electro-dynamic microphone.
  - (e) What is stroboscope? Explain its working principle.
  - (f) List various advantages of electromagnetic flowmeter.

5. Attempt any **FOUR** of the following: [16]
- Explain working and application of bonded strain gauge.
  - Explain with a neat sketch, working of Bourdon-Tube pressure gauge.
  - In a lathe cutting test, the following data has been obtained :
    - Tangential force = 795 N      (ii) Axial force = 88 N
    - Speed of spindle = 300 rpm      (iv) Feed Rate = 0.8 mm per revolution
    - Mean diameter of cut = 0.1 m and
    - Power input to 3 phase motor = 875 watt/phase
 Calculate : (1) Power absorbed in rotating the work piece  
 (2) Power absorbed in feeding the tool along the work piece  
 (3) Calculate over all efficiency.
  - Explain proportional and derivative type (PD) control action.
  - With a suitable example, explain servo motor mechanism.
  - Explain working of D.C. position control system.
6. Attempt any **FOUR** of the following: [16]
- Explain the working of optical Encoder with its neat sketch of construction.
  - Explain strain measurement method using load cell with a neat sketch.
  - Explain the working of piezoelectric type pressure transducer for pressure transducer with a neat sketch.
  - Explain working principle of eddy-current dynamometer.
  - Explain control system for speed control of motor.
  - What is optical measurement scale? Explain.

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Paper Discussion Schedule for T.Y. Diploma (Sem. V) – All Subjects

Date	Day	Timing	Centres
14 Nov. 2016	Monday	9 a.m. to 11 a.m.	Dadar, Nerul
14 Nov. 2016	Monday	12 noon.to 2 p.m.	Thane