

17551

16117

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

20

- (a) Distinguish between accuracy and precision.
- (b) Compare closed loop system and open loop system.
- (c) How errors are classified ? Explain any one.
- (d) State advantages and limitations of potentiometer.
- (e) State specifications of RVDT.
- (f) State advantages and limitations of liquid filled thermometer.
- (g) Explain the working principle of capacitive type transducer with a neat sketch.

2. Attempt any FOUR :**16**

- (a) How are transducers classified ? Explain working of inductive type transducers with a neat sketch.
- (b) How linear potentiometer is used for displacement measurement ?
- (c) What are the different types of strain gauges ? Explain unbounded strain gauge with a neat sketch.
- (d) State how McLeod gauge is used for pressure measurement.
- (e) Compare hydraulic and pneumatic control system.
- (f) The dead cone in certain thermometer is 0.125% of span. The calibration is 400 °C to 1200 °C. What temperature change might occur before it is detected ?

3. Attempt any FOUR :**16**

- (a) Classify instruments on the basis of following :
 - (i) Application
 - (ii) Mode of operation
 - (iii) Nature of o/p signal
 - (iv) Method of energy conversion
- (b) State any two advantages and two disadvantages of Ionization gauge, used for a low pressure measurement.
- (c) Draw neat sketch of 'Rotameter' and explain its working.
- (d) Explain with neat sketch working of strain gauge type load cell.
- (e) Explain working of ultrasonic flow meter with a sketch.
- (f) Define :
 - (i) Calibration
 - (ii) Sensitivity
 - (iii) Hysteresis
 - (iv) Drift

4. Attempt any FOUR :**4 × 4 = 16**

- (a) State law of intermediate temperatures & law of intermediate metals for a thermocouple.
- (b) Explain with a neat sketch principle and working of LVDT.
- (c) Explain with neat sketch the working of hot wire anemometer.
- (d) State any four desirable characteristics of thermocouple material.
- (e) Explain the working of stroboscope with a neat sketch.
- (f) Explain servomotor mechanism with a neat block diagram.

5. Attempt any FOUR :**16**

- (a) Explain with a neat sketch, working of optical pyrometer.
- (b) State the units of absolute humidity. Explain the working of hair hygrometer.
- (c) Differentiate between resistance thermometer and thermister.
- (d) State any two advantages and two disadvantages of a feed forward control system.
- (e) Explain with a neat sketch bimetallic thermometer.
- (f) A disc having 60 holes on its periphery is mounted on the shaft. Calculate the speed of shaft in rpm, if electric tachometer is used & no. of pulses registered are 3000 pulses / sec.

P.T.O.

6. Attempt any FOUR :**16**

- (a) Describe the working of an Electrical resistance type pressure gauge with a neat sketch. State its pressure measurement range.
 - (b) State any two advantages and two disadvantages of electromagnetic flow meter.
 - (c) Describe the proportionate control action with the help of a neat graphical sketch.
 - (d) With the help of functional block diagram, explain feedback control system.
 - (e) With the help of a neat sketch, explain the working of DC motor speed control.
 - (f) Explain the working of strain gauge type transmission dynamometer with the help of a neat sketch.
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