

17528

16172

3 Hours / 100 Marks

Seat No.

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- 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.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any THREE :

12

- (i) Define the term, 'Threshold', 'Resolution', 'Repeatability' and 'Reproducibility'.
- (ii) What are different types of errors in measurement system ? Give classification.
- (iii) Explain with neat sketch working principle of LVDT.
- (iv) Draw a neat sketch of linear Potentiometer for displacement measurement, explain its working.

(B) Attempt any ONE :

6

- (i) Define transducer. Explain the classification of transducers with suitable example.
- (ii) Explain with neat sketch working of McLeod gauge.

- 2. Attempt any TWO :** **16**
- (a) Define Calibration. Explain the need of calibration of measuring instruments. State calibration procedure you can undertake in your laboratory for bourdon pressure gauge calibration.
 - (b) Write down about specifications, selection and applications of displacement transducer.
 - (c) List the electrical and non-electrical methods for temperature measurement. Explain with neat sketch Liquid-in-glass thermometer.
- 3. Attempt any FOUR :** **16**
- (a) Explain with neat sketch 'Thermal conductivity gauge'.
 - (b) Explain significance of measurement and importance of Linearity for instruments.
 - (c) Explain Radiation Pyrometer with neat sketch.
 - (d) Explain law of intermediate temperature and law of intermediate metal.
 - (e) Distinguish between Non-electrical methods and Electrical methods for temperature measurements.
- 4. (A) Attempt any THREE :** **12**
- (a) Explain working principle of thermistor. State its types.
 - (b) Draw neat sketch of Ultrasonic Flow Meter and explain how flow is measured by it.
 - (c) Explain with neat sketch Hair Hygrometer for humidity measurement.
 - (d) Explain with neat sketch how Load Cell is used for strain measurement.
- (B) Attempt any ONE :** **6**
- (i) Compare Hydraulic & Pneumatic type of control system. (minimum six points)
 - (ii) What is servomotor mechanism ? Explain its importance in control system.

5. (A) Attempt any TWO :**16**

- (i) During a test on a I.C. Engine fitted with a rope brake, the diameter of the brake wheel is 600 mm and rope diameter is 26 mm. The dead load on the brake is 200 N. Spring balance reads 30 N. Speed of engine is 450 rpm. Calculate the power in kW.
 - (ii) Explain the importance of humidity measurement in industry. Name some processes which might require humidity control for efficient operation.
- (B)**
- (i) Draw block Diagram of feed forward control system & state it's working principle.
 - (ii) State function of PID controller.
- (C)**
- (i) How feedback control system is used for temperature control of boilers.
 - (ii) Explain control system for speed control of motor.

6. Attempt any FOUR of the following :**16**

- (a) Explain the working of Rotameter with the help of neat diagram.
 - (b) How flow is measured by Hot wire Anemometer ?
 - (c) Explain working of turbine meter for flow measurement with neat sketch.
 - (d) Explain with neat sketch the working of slipping clutch tachometer.
 - (e) Explain with neat sketch the working of capacitive transducer for liquid level measurement.
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