17551

21415

3 Hours/100 Marks

Seat No. | | | | | | | | |

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) ***Assume*** *suitable data,* ***if necessary****.*
(5) ***Use*** *of non-programmable Electronic Pocket Calculator is* ***permissible****.*

MARKS

1. Attempt **any five** : **(4×5=20)**

   a) Enlist low pressure measurement and high pressure measurement devices.

   b) Distinguish between i) Accuracy and precision and ii) Threshold and resolution.

   c) Enlist the various flow measuring devices/metres. State the operating principle of any two.

   d) State the law of intermediate temperature and law of intermediate metals.

   e) Explain the importance of calibration of instrument during measurement.

   f) Explain the different types of strain gauges.

   g) Explain servo motor mechanism with neat block diagram.

2. Attempt **any four** : **(4×4=16)**

   a) State applications of measurements and control for set up of boiler and air conditioner.

   b) Define the following terms :

      i) Range ii) Span iii) Drift and iv) Dead zone

   c) Compare thermistor and RID by four points.

   d) Explain the working of hot wire anemometer with neat sketch.

   e) Draw neat sketch of McLeod Gauge and explain its principle.

   f) State advantages and disadvantages of hydraulic controller.

P.T.O.

MARKS

3. Attempt **any four** : **(4×4=16)**
   a) With neat sketch explain operation of optical pyrometer.
   b) Give classification of errors and explain any two errors in detail.
   c) How linear potentiometer is used for measurement of displacement ? Explain.
   d) State any four desirable characteristics and principle of thermocouple.
   e) With neat sketch explain the working of carbon microphone.
   f) Define transducer. Give classifications of transducer with example for each type.

4. Attempt **any four** of the following : **(4×4=16)**
   a) Explain with the help of block diagram automatic control system.
   b) Explain with neat sketch principle and working of LVDT.
   c) Explain the working of rotameter with neat sketch.
   d) Explain the working of stroboscope with neat sketch.
   e) Compare open loop and closed loop control system (any 4 points).
   f) Explain Seebeck effect and Peltier effect.

5. Attempt **any four** of the following : **(4×4=16)**
   a) Explain the working of capacitive transducers with neat sketch.
   b) Explain feedback and feed forward control systems with block diagram.
   c) Draw block diagram of generalised measurement system. State functions of each block.
   d) State advantages and disadvantages of electronic control system.
   e) Explain with neat sketch working of tool dynamometer.
   f) Explain concept of optical measurement scale and encoders.

6. Attempt **any four** : **(4×4=16)**
   a) With neat sketch, explain flow measurement by using ultrasonic flow meter.
   b) Compare hydraulic and pneumatic control system (any 4 points).
   c) State the units of humidity. Explain the working of hair hygrometer.
   d) The dead zone in certain thermometer is 0.125% of span. The calibration is 400°C to 1200°C. What temp. change might occur before it is detected ?
   e) Draw neat sketch of RVDT and state any two applications of it.
   f) A disc having 60 holes on its periphery is mounted on shaft. Calculate the speed of shaft in rpm if electric tachometer is used and no. of pulses registered are 3000 pulses/sec.
