17528

21415

3 Hours/100 Marks

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

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.*

(7) Use of Steam tables, logarithmic, Mollier's chart is ***permitted****.*

MARKS

1. Answers **any five** questions of the following :

a) Explain the difference between Accuracy and precision in an instrument. **4**

b) Define sensitivity drift and zero drift. What factors can cause sensitivity drift and zero drift in instrument characteristics ? **4**

c) Explain the construction and working of LVDT. **4**

d) Explain with a neat sketch the constructional features and basic working principle of Mcleod gauge used for the measurement of law pressures. **4**

e) Classify the temperature measuring instruments and indicate approximate temperature range of each category. **4**

MARKS

f) List suitable applications of following flow measurement devices :
   i) Rotameter
   ii) Hot Wire Anemometer
   iii) Electromagnetic Flow Meter
   iv) Ultrasonic Flow Meter. **4**

g) List the main requirements of material used for a strain gauge. **4**

2. Attempt **any five** of the following :

a) State and explain any two dynamic properties of measurement system. **4**

b) State the differences between hydraulic system and pneumatic system. **4**

c) Explain with neat sketch PID control action. **4**

d) Explain the use of wire wound potentiometers for the measurement of linear and rotary motions. **4**

e) Explain the working of platinum Resistance Thermometer (RTD) with a neat sketch. **4**

f) Draw a neat labelled diagram of turbine flowmeter and explain its working. **4**

3. Attempt **any four** of the following :

a) Explain with neat sketch working of any one Thermo-resistance Transducer. **4**

b) What is psychrometer ? Draw a neat sketch of sling psychrometer with proper labelling. **4**

c) Explain with a neat sketch the float and tape gauge liquid level measurement method. **4**

d) Explain the positive and negative feedback in a closed loop control system with suitable example of each. **4**

e) Explain with neat sketch the construction and working of thermocouple. What are the different materials used for developing thermocouple. **4**

f) Explain the working of rotameter with neat sketch. **4**

MARKS

4. Attempt **any four** of the following :

   a) List advantages and disadvantages of capacitive transducer used for measurement of displacement. **4**

   b) Compare pressure gauge measurement devices, diaphragm and Bellows on the basis of :

      1) Working principle

      2) Construction

      3) Pressure range

      4) Applications. **4**

   c) Explain working of turbine meter for flow measurement with neat sketch. **4**

   d) What are thermistors ? Explain the principle of operation and give its advantages. **4**

   e) Explain with neat sketch strain gauge transmission dynamometer. **4**

   f) Draw the block diagram of feed-forward control system and state its advantages. **4**

5. Attempt **any four** of the following :

   a) Explain the difference between systematic and random errors. What are the typical sources of these two types of errors ? **4**

   b) State advantages and disadvantages of Pirani gauge. **4**

   c) Explain with neat sketch working of optical pyrometer. **4**

   d) Explain working eddy current dynamometer with a neat labelled diagram. **4**

   e) Explain of system used in air conditioner. **4**

   f) Explain with neat sketch ON-OFF control system. **4**

MARKS

6. Attempt **any four** of the following :

a) Compare between active and passive transducers. (four points) **4**

b) Explain working of incremental encodes for measuring displacement with neat sketch. **4**

c) Compare between thermocouple and thermistor on the basis of :

i) Construction

ii) Temperature Range

iii) Size

iv) Sensitivity

v) Cost

vi) Effect of ambient condition. **4**

d) Draw a neat labelled diagram of electro-magnetic flow meter. State its limitations. **4**

e) Draw and explain the semiconductor strain gauge. List its advantages. **4**

f) Explain with use of block diagram how feedback back control system can be used for Domestic Air-Conditioners. **4**
