17528

21819

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) Figures to the right indicate full marks.

(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 of the following: **20**

a) Define:

(i) Threshold

(ii) Drift

(iii) Speed of response and

(iv) Overshoot

b) Differentiate between accuracy and precision.

c) Explain: Observational and Environmental Error.

d) Explain the procedure with neat sketch to use wire wound linear potentiometer for displacement measurement.

e) Explain working of LVDT with the help of neat sketch.

f) List the specifications for displacement transducer.

g) List the electrical and Non-electrical methods for temperature measurement.

Marks

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

a) Define transducer. Classify transducers with suitable examples.

b) Explain with neat sketch procedure to use capacitive transducer for liquid level measurement.

c) Explain MC Leod gauge with neat sketch.

d) Compare pressure measuring devices diaphragm and Bellows type on the basis of:

(i) Construction

(ii) Working principle

(iii) Material

(iv) Applications

e) Explain working of Bi-metallic thermometer with neat sketch.

f) Explain the law of:

(i) Intermediate temperature

(ii) Intermediate metal.

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

a) A thermometer has range 0°C to 200°C. It has accuracy of ±1% of full scale value. Find the error in the reading of 63°C.

b) Explain with neat sketch photoelectric pressure transducer.

c) Explain working of ionization gauge for pressure measurement.

d) Differentiate between RTD and thermistor.

e) Explain with neat sketch working of thermocouple.

f) Explain with neat sketch optical pyrometer.

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

a) Explain construction and working of Rotameter with neat diagram.

b) Describe the working of electromagnetic flow meter with schematic sketch.

Marks

c) State the suitable devices for flow measurement of:

(i) Wind flow

(ii) Paper pulp

(iii) Flow rates in R and D work

(iv) Slurries

d) Explain construction and working of piezo-electric microphone with neat sketch.

e) Explain with neat sketch sling psychrometer for humidity measurement.

f) Draw the block diagram of automatic control system. Explain function of each block.

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

a) Describe ultrasonic flow measurement. Explain with neat sketch.

b) Explain with neat sketch vortex-type flow meter.

c) Explain construction and working of Gamma ray liquid level sensor with neat sketch.

d) Lathe tool dynamometer recorded tangential force 800 M and axial force of 100 N during a lathe cutting test. Following data was obtained:

(i) Speed of spindle = 300 rpm

(ii) Feed rate = 0.8 mm / revolution

(iii) Mean diameter of cut = 100 mm (mm)

Calculate

1) Power absorbed in rotating work piece.

2) Power absorbed in feeding the tool.

e) Explain feed forward control system with the help of neat sketch.

f) Compare hydraulic and electronic control system.

Marks

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

a) Describe speed measurement by using stroboscope.

b) Explain load measurement by using load cell with neat sketch.

c) Explain servomotor mechanism with neat sketch. State its applications.

d) Explain PID control action.

e) Explain control system for air conditioner (AC).

f) Compare between open loop and closed loop control system.