17551

15116

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) 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. Attempt **any five** of the following : **(4×5=20)**

a) Define :
i) Hysteresis ii) Dead zone
iii) Fidelity iv) Speed of response **4**

b) What is open loop control system ? Explain with suitable example. **4**

c) Define transducer and list the advantages of electrical transducers. **4**

d) Explain the principle and working of vapour pressure thermometer. **4**

e) How flow is measured by hot wire anemometer ? **4**

f) Explain principle and working of hair hygrometer with a neat sketch. **4**

g) Write any four advantages and limitations of LVDT. **4**

2. Attempt **any two** of the following : **(8×2=16)**

a) How are transducers classified ? Explain piezo resistive type transducer. State its advantages. **8**

b) Describe the PI mode of control. State its advantages and limitations. **8**

c) i) How linear potentiometer is used for measurement of displacement ? **4**

ii) Compare resistance thermometer and thermistor. **4**

3. Attempt **any four** of the following : **(4×4=16)**

a) Explain working of bimetal helix thermometer with a neat sketch. What is the advantage of bimetallic helix thermometer over plain bimetallic thermometer ? **4**

P.T.O.

Marks

b) Explain working of rotameter with a neat sketch. **4**

c) How speed measurement is done by stroboscope ? **4**

d) Explain working principle of radiation pyrometer. **4**

e) Compare hydraulic and electronic control system. **4**

f) A Wheatstone bridge requires a change of $8\,\Omega$ in the unknown arm of the bridge to produce a 2 mm change in the deflection of the galvanometer. Determine the bridge sensitivity. **4**

4. Attempt **any four** of the following : **(4×4=16)**

a) Explain the construction and working of a rotary encoder. **4**

b) Explain with neat sketch electromagnetic flowmeter. **4**

c) State the installation procedure of bonded strain gauge. **4**

d) Draw the block diagram of automatic control system and explain. **4**

e) Draw the constructional details of a 'C' type Bourdon tube and explain its working. **4**

f) How measurement errors are classified ? Explain any one. **4**

5. Attempt **any four** of the following : **(4×4=16)**

a) Draw the set-up for pressure controlling of boiler and explain. **4**

b) State the law of intermediate temperature and law of intermediate metal for thermocouples. **4**

c) Explain the principle and working of variable capacitor pressure transducer. **4**

d) Draw the block diagram of a generalised measurement system and explain their working. **4**

e) How pressure is measured by Pirani vacuum gauge ? Explain with a neat sketch. **4**

f) While measuring speed of a steam turbine with stroboscope, single lines were observed for stroboscope setting of 3600, 1800, 1200, 900 and 720 rpm. Calculate the speed of the turbine. **4**

6. Attempt **any four** of the following : **(4×4=16)**

a) Explain with neat sketch working principle of capacitive pick-up tachometer. **4**

b) Explain the working of Mcleod gauge with a neat sketch. **4**

c) Explain servomotor mechanism with a suitable diagram. **4**

d) Explain with neat sketch platinum resistance thermometer. **4**

e) Explain with neat diagram turbine meter for flow measurement. **4**

f) Explain with neat sketch foil type bonded strain gauge. **4**
