

22348

24225

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :**
- (1) Illustrate your answers with neat sketches wherever necessary.
 - (2) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

10

- (a) State seebeck effect with respect to thermocouple.
- (b) State the need of electrode jelly used to place an electrode on the patient's body.
- (c) List any four pressure transducers.
- (d) Name the electrical signal generated by (i) Electrical activity of heart (ii) Electrical activity of brain.
- (e) List any two chemical sensors.
- (f) List any two types of temperature transducer.
- (g) State the principle of pH electrode.

2. Attempt any THREE :

12

- (a) Compare RTD & thermocouple on the basis of (i) Working principle (ii) Materials used (iii) Temperature Range (iv) Symbols (diagram).
- (b) State the principle of strain gauge. Draw a labelled diagram of bonded strain gauge.
- (c) Draw block diagram of man instrumentation system. State the role of each block.
- (d) With neat circuit diagram give operating principle of electromagnetic flow x'ducer.



- 3. Attempt any THREE :** **12**
- (a) With neat circuit diagram give working principle & application of LVDT.
 - (b) Define transducer. Compare primary and secondary transducer. (Any two points)
 - (c) List different surface electrodes & give application of each electrode.
 - (d) Draw a neat sketch of radiation thermometer and state its any two applications.
- 4. Attempt any THREE :** **12**
- (a) With neat diagram give working of plethysmograph.
 - (b) Draw a labelled diagram of bellows and explain its working.
 - (c) Draw a neat diagram of micro electrodes and explain its working.
 - (d) Explain working of thermistor with suitable diagram.
 - (e) With neat diagram give working of photomultiplier tube. List 01 application of the same.
- 5. Attempt any TWO :** **12**
- (a) An unbonded strain gauge has a resistance of $6000\ \Omega$ of gauge factor of 4.2. What will be the change in resistance due to 3000 micro strain ?
 - (b) State any four units of temp. A platinum RTD has a resist. of $100\ \Omega$ at $25\ ^\circ\text{C}$. Find its resist. at $100\ ^\circ\text{C}$. Temp-coefficient is $0.003921\ ^\circ\text{C}$.
 - (c) With neat diagram explain working of PCO_2 electrode. List its applications.
- 6. Attempt any TWO :** **12**
- (a) (i) Define Polarizable & Non-polarizable Electrodes.
(ii) State the use of following electrode :
 - (1) Needle electrode
 - (2) Wire electrode
 - (3) Micro electrode
 - (4) Micropipette
 - (b) With neat dia. give working of ultrasound flow meter. List its two applications.
 - (c) (i) Explain the concept of active and passive transducer with suitable example.
(ii) List and define any two dynamic characteristics of transducer.
-