SE (Biomedical) (Sem. IV) (R) May 08
Sub: Transducers in Biomedical Instrumentation
22/5/08
117

n. 2764–08. **(REVISED COURSE)** **CO–9796**

(3 Hours) **[Total Marks : 100**

3. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from the remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.

(a) Explain the principle and working of an electromagnetic blood flow meter. **10**
(b) Explain with neat diagrams the laws governing thermocouples. **10**

(a) Differentiate between first order system and second order system giving suitable examples. **8**
(b) Explain with suitable diagram the construction and working of LVDT. Give an application of it. **12**

(a) Explain with a block diagram the various factors considered for selecting a transducer for Biomedical application. **10**
(b) Define pH. Describe the transducer system used to measure pH of blood. **10**

a) Define and derive the gauge factor for strain guages. Explain the construction and working of an unbonded strain gauge. **16**
b) What is a thermistor ? How are they classified ? **4**

(a) What is Fick's Principle ? Explain how rapid injection dilution method is used for measuring cardiac output. **12**
(b) Draw the equivalent circuit model for electrode-skin interface. **8**

(a) What is Doppler shift ? With the help of a block diagram, explain how ultrasonic transducers are used to measure blood flow. **12**
(b) Discuss the principle and working of pulse transit time flowmeter. **8**

Write short notes on any **four** :– **20**
(a) Primary and secondary transducers
(b) Radiation thermopiles
(c) Enzyme electrode
(d) RTD
(e) PCO_2 Electrode
(f) Fibre optic pressure transducer.

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