

SE Sem IV / Biomed / Choice Based

13/05/19

Subject Code: 40102 / Biomedical transducers and Measuring Instruments

Q.P.Code: 40279

(3 Hrs.)

[Total Marks : 80]



- (1) Question No. 1 is Compulsory.
  - (2) Attempt any three questions out of remaining five.
  - (3) Figures on the right indicate full marks.
  - (4) Assume data wherever necessary.
  - (5) Draw diagrams / sketches wherever necessary.
  - (6) Use legible handwriting. Use blue / black ink only.
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- (a) Differentiate between active and passive transducers giving suitable example. 05
  - (b) What is motion artefact? How it can be minimized. 05
  - (c) Explain with a neat diagram electrolyte-skin interface 05
  - (d) Define accuracy and precision giving suitable example 05
  - (a) Compare between dual trace and dual beam oscilloscope 08
  - (b) Giving suitable example explain zero order, first order and second order system 12
  - (a) Explain the construction and working of L.V.D.T. Explain the need of phase sensitive demodulator with the help of necessary diagrams 12
  - (b) Explain the use of piezoelectric transducer for the measurement of pressure measurement 08
  - (a) Explain with neat diagram different methods of thermistor linearization 08
  - (b) Resistance of thermistor at 25°C is 1000Ω. What will be its value if temperature is increased by 15°C. ( $\beta=4000K$ ). What value of resistance to be connected in parallel to linearize this thermistor if it is to be used in the range 25°C - 45°C. 08
  - (c) Explain the principle of working of light dependent resistor. 04
  - (a) Define and classify biosensor. Explain any one type giving suitable example 10
  - (b) Explain construction and working of PO<sub>2</sub> and PCO<sub>2</sub> electrode 10
- Write short notes on (any four) 20
- (a) Elastic pressure sensor
  - (b) IC based temperature sensor
  - (c) Applications of DSO
  - (d) True RMS responding voltmeter
  - (e) Radiation thermopile

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