

(18)

S.E
BM / IV / CBGS
TSMA

Q.P. Code : 3574

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions from the remaining questions.
(3) Figures to the right indicate full marks.
(4) Make necessary assumptions wherever require and state them.

1. Attempt any four :-

- (a) Explain the typical Current versus Voltage characteristics of the bead type NTC thermistor. 5
(b) Explain the capacitance microphone used for measuring dynamic displacement changes. 5
(c) Explain the different internal electrodes used to measure the biopotentials. 5
(d) Explain the blood gas and acid - base physiology 5
(e) Classify biosensors. Define each type. 5

2. (a) With the help of an example explain in detail the second order instrument characteristics. 6
(b) Explain the different types of pressure sensing elements. 8
(c) A two-wire unbonded strain gauge system of gauge resistance $1k\Omega$ each is connected to a Wheatstone bridge. In the others two arms fixed resistors of $1k\Omega$ each are connected. If the applied stress has caused a 2% change in the guage length, calculate the bridge output. The bridge excitation voltage is 5Vdc and the gauge factor is 2. 6

3. (a) Distinguish between potentiometric and amperometric sensors. Explain one example of an amperometric sensor. 10
(b) Explain the term immunosensor. With the help of a diagram explain in detail any one immunosensor. 10

4. (a) Explain the following static characteristics with examples : 10
(i) Hysteresis
(ii) Linearity
(iii) Sensitivity
(iv) drift.
(b) Explain the construction and working of LVDT. Draw the necessary diagrams. 10

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15/5/15.

(2)

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5. (a) Drawing the labelled diagrams explain the laws governing the thermocouples. State the advantages and disadvantages of thermocouples. 10
- (b) What is half cell potential? Draw the diagram of Ag/AgCl electrode and prove that the half cell potential of Ag/AgCl electrode is quite stable when placed in an electrolyte having chloride (Cl) ions with stable activity as the principal anion. 10
6. (a) Explain the fibre optic temperature transducer. 6
- (b) Explain photon sensors 8
- (c) Explain microelectrodes. 6
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