

Con. 2848-09.

(REVISED COURSE)

16/5/09

VR-3802

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question No.1 is compulsory.
(2) Attempt any four questions out of remaining five questions.
(3) Figures to the right indicate full marks.

1. (a) Explain with block diagram the generalized instrumentation system. 10
(b) Explain the various factors considered for selecting a transducer for biomedical applications. 10
2. (a) Explain with suitable examples the following characteristics of an instrument :- 10
(i) Input impedance
(ii) Output impedance
(iii) Linearity
(iv) Hysteresis
(v) Accuracy.
(b) Differentiate between first order system and second order system with general transfer function. Explain suitable example for each. 10
3. (a) What are the displacement transducers ? Explain with suitable labelled diagram three types of potentiometric transducers used for measurement of displacement with their working principle. 10
(b) What are inductive type of transducers used for displacement measurement ? Explain with suitable diagram the working principle of three types of inductive displacement type of transducers. 10
4. (a) What are the temperature transducers ? Explain the working of NTC and PTC thermistors with suitable characteristics. Explain the terms involved in equation of thermistor. Also explain the procedure to linearize the non-linear characteristics of NTC thermistor. 10
(b) Classify Biosensors. Explain catalytic biosensor in detail. 10
5. (a) What is capacitive transducer ? Explain how is it used to measure displacement with suitable diagram and necessary mathematical equations. 10
(b) What is half cell potential ? How is it measured ? Explain the overpotential and its types in detail. 10
6. (a) What is pH ? 10
How are solutions classified on the basis of pH value ? Explain the basic principle used to determine the value of pH along with constructional details of pH electrode.
(b) What are the Radiation sensors ? Explain applications of each in short. 10