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Fourth Semester B.E. Degree Examination, July/August 2022 Biomedical Transducers and Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain characteristics of the Measurement System. (12 Marks)
- b. Describe the principle of a Potentiometric displacement transducer. (08 Marks)

OR

- 2 a. Explain factors affecting the physical characteristics of the measurement system. (08 Marks)
- b. Define the term Accuracy and Error. Discuss types of Error. (12 Marks)

Module-2

- 3 a. Explain the phenomena of Tissue electrode interaction with electrode jelly. (08 Marks)
- b. Define ECG. Discuss various Electrodes used for ECG. (12 Marks)

OR

- 4 a. With a schematic, explain the phenomena of Action potential. (10 Marks)
- b. What are Microelectrodes? With necessary schematic, describe types of microelectrodes. (10 Marks)

Module-3

- 5 a. Explain Diaphragm displacement transducer. (10 Marks)
- b. What is Catheter? Describe Catheter - tip pressure transducer. (10 Marks)

OR

- 6 a. Define Blood Pressure. With a schematic, explain Indirect measurement of instantaneous arterial pressure. (12 Marks)
- b. Describe Pressure Telemetry Capsule. (08 Marks)

Module-4

- 7 a. Discuss the requirements for body temperature measurement ranges. (08 Marks)
- b. Discuss different types of Clinical thermometers. (12 Marks)

OR

- 8 a. With a schematic, describe elements of Biosensor. Give its applications. (10 Marks)
- b. Define Calorimetry. Discuss types of direct calorimeters. (10 Marks)

Module-5

- 9 a. Explain the principle of Electromagnetic Flow meter. (12 Marks)
- b. Describe Impedance Cardiography with the tetrapolar electrode arrangements. (08 Marks)

OR

- 10 a. What is Thermodilution? Describe the Thermodilution catheter. Explain Thermodilution method. (12 Marks)
- b. Describe Perivascular and Intravascular Doppler Probes. (08 Marks)