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Total Number of Pages: 02

B.Tech
PEEC5416

7th Semester Regular / Back Examination 2017-18
BIOMEDICAL INSTRUMENTATION

BRANCH: AEIE, BIOTECH, CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC, IEE, IT, ITE

Time: 3 Hours

Max Marks: 70

Q.CODE: B373

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

- a) Differentiate between bioengineering and bioscience.
- b) Mention any two transducers for body temperature measurement.
- c) Define bioelectrical signal with an example.
- d) Write few important biomedical usefulness of patient monitoring system.
- e) What is common impedance coupling?
- f) Define Gross shock and Micro current shock.
- g) List out the important parameters which are essential for patient monitoring.
- h) What is an ECG 'Lead'?
- i) List names of commonly engaged pressure transducers used in biomedical instrumentation.
- j) What is a catheter tip type pressure transducer?

Q2 a) What is a Biomedical Signal? List various biomedical signals and mention their sources. (5)

b) List the general constraints in biomedical instrumentation system. Explain in brief. (5)

Q3 a) Explain any one direct method of blood pressure measurement. (5)

b) Mention the different range of EEG waves and their significance in EEG analysis. (5)

Q4 a) What is an electro cardiogram? Describe the different electrodes used for ECG with suitable diagrams. (5)

b) What special features of bioelectric amplifiers make them suitable for Biomedical applications (5)

Q5 a) Describe with help of a block diagram the telemetry system for ECG and respiration rate. (5)

b) Explain Korotkoff method of indirect blood pressure measurement (5)

Q6 a) How electrostatic and electromagnetic signals become a source of noise to biosignals? Briefly explain how it can be eliminated? (5)

b) What is the principle behind blood volume measurement by impedance method ? Derive an equation for the variation of blood volume in a vessel with the change in its basal resistance. (5)

Q7 Describe with the help of diagram, the important building blocks of a multi channel ECG machine. What is the role of a microprocessor used in such machine? (10)

Q8 Write short answer on any TWO: (5 x 2)

a) Biosensor

b) Phonocardiograph

c) Ultrasonic Blood Flow Meter

d) Inkjet Recorder