

Registration no:

--	--	--	--	--	--	--	--	--	--

Total Number of Pages: 2

B.Tech
PEEC5416

7th Semester Regular / Back Examination 2016-17

BIOMEDICAL INSTRUMENTATION

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

Time: 3 Hours

Max Marks: 70

Q.CODE: Y155

**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) Why Ag-AgCl electrode is the most preferred electrode in Biomedical Instrumentation?
- b) Distinguish between active and passive transducer.
- c) Mention different techniques to calculate heart rate.
- d) Define gauge factor of a strain gauge.
- e) What is Apnoea and in which clinical condition does it occur ?
- f) What are the advantages of Intelligent medical Instrumentation system?
- g) Write down the effects of motion artifact.
- h) Write down the normal ranges of heart rate and blood pressure of a person.
- i) Write four precautions to minimize electric shock.
- j) What is Helmholtz Double Layer?

Q2 a) Briefly describe the various sources of biomedical signals with example. (5)

b) Describe general constraints in the design of medical instrumentation system. (5)

Q3 a) Draw the block diagram of an instantaneous heart rate monitor and explain each block. (5)

b) What is a biosensor? Describe the constructional details of any one of the biosensors. (5)

- 210 210 210 210 210 210 210 210
- Q4** Describe the origin of bioelectrical signal with required diagrams. **(10)**
210 210 Draw the typical cell potential waveform. 210 210
- Q5** a) Draw and explain any one indirect method of blood pressure measurement. **(5)**
b) Explain thermistors and its biomedical applications. **(5)**
- Q6** a) Explain any two methods of respiration rate measurement. **(5)**
210 210 210 210 210 210 210 210
b) What is an electroencephalogram? Draw and explain any one of the electrodes used in EEG. **(5)**
- Q7** a) Show that the induced voltage is directly proportional to the flow rate through the blood vessel in electromagnetic blood flowmeter. **(5)**
210 210 b) Briefly explain various biomedical signal analysis techniques. 210 **(5)** 210
- Q8** Write short notes on any two : **(5X2)**
- a) Phonocardiograph
 - b) Electric shock hazards and effects of electric current on human body
 - c) Direct writing recorders
 - d) Ag-AgCl electrodes
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210