

Registration no:

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

Total Number of Pages: 2

B.Tech
PCBM4304

6th Semester Regular / Back Examination 2016-17

BIOMEDICAL SIGNAL PROCESSING

BRANCH(S): AEIE, EIE, IEE

Time: 3 Hours

Max Marks: 70

Q.CODE: Z867

**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) What is the frequency range of beta wave in EEG? What is its significance?
 - b) Mention any two advantages of Adaptive Noise Canceller.
 - c) What is the function of a sodium pump?
 - d) What is a carotid pulse?
 - e) Give any four example of a bioelectrical signal.
 - f) Define unvoiced sound with an example.
 - g) What is heart murmuring?
 - h) Draw the PQRST curve of an ECG and label it
 - i) What is the clinical importance of EMG signal?
 - j) What is a dicrotic notch?
- Q2 a) How to identify the beginning of S2 in a PCG signal? (2)**
b) Explain the electrical system of heart with a neat diagram. (8)
- Q3 a) Discuss the sources of interference for the measurement of ECG. (5)**
b) Explain Einthoven's triangle with required diagram. (5)
- Q4 a) What is the clinical importance of EEG? Mention the different conditions where beta and alpha waves are generated. (5)**
b) What is 10/20 electrode system? Explain the electrode position on the scalp in EEG. (5)
- Q5 a) Discuss about the different problems that occur while taking measurement from phonocardiogram(PCG) and Electrocardiogram(ECG) (5)**
b) Write a short note on Vibroarthrogram. (5)

- Q6 a)** How Pan-Tompkins algorithm can be used for real time detection of QRS complex of ECG? **(5)**
- b)** How cancellation of donor- heart interference in heart- transplant electrocardiography is done using ANC? **(5)**
- Q7** Explain all the types of biomedical signals along with example. **(10)**
- Q8 Write short answer on any TWO:** **(5 x 2)**
- a)** Electrogastrogram
 - b)** Powerline interference in ECG
 - c)** Electroneurogram
 - d)** Adaptive Noise Canceller