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Total Number of Pages: 2

B.Tech
PCBM4304

6th Semester Regular / Back Examination 2016-17
BIOMEDICAL SIGNAL PROCESSING
BRANCH(S): BIOMED, ECE, ETC
Time: 3 Hours
Max Marks: 70
Q.CODE: Z240

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 do you mean by refractory period?
b) What is Sino Atrial Node?
c) Define bioelectrical signal with an example.
d) What is vibromyography?
e) What is the reason behind the formation of a P- wave?
f) What is a spike in EEG?
g) What is an ERT?
h) What is a biosignal? Give an example.
i) Define voiced sound with an example.
j) What is an action potential?

Q2 **a)** Name any two applications of adaptive noise canceller in Biomedical Signal Processing. **(2)**

b) What is Adaptive Noise Canceller? What is maternal interference in fetal ECG? How it can be eliminated by ANC? **(8)**

Q3 **a)** Analyze PQRST waveform of an ECG with a neat diagram. **(5)**

b) Explain the standard 12- channel electrode configuration in ECG with a neat diagram. **(5)**

Q4 **a)** Write down the classification of EEG rhythms based on the frequency band. **(5)**

b) Explain 10-20 electrode system of EEG with a diagram. **(5)**

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Q5 **a)** What is a pill electrode and how it is used to obtain a strong and clear signal of atrial activity? **(5)**

b) Mention a technique to identify the beginning of S1 in a PCG signal and extract the heart sound signal over one cardiac cycle. **(5)**

Q6 **a)** Explain the different components of a PCG signal and explain their significance. **(5)**

b) Propose an algorithm to detect the P wave in the ECG signal. **(5)**

Q7 Explain polarization, depolarization and repolarization with a neat diagram. Draw the action potential waveform. **(10)**

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

a) Vibroarthrogram

b) Electrogastrogram

c) Phonocardiography

d) Pan- Tompkins Algorithm.