Total No. of Questions : 8]

SEAT No. :

P3629

[Total No. of Pages : 2

[4959]-1118
B.E. (Electronics)
BIOMEDICAL SIGNAL PROCESSING
(2012 Pattern) (End Sem.) (Revised)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Explain Pan Tomkins algorithm for QRS detection in an acquired ECG signal. **[8]**

b) Explain the electro conduction system of heart. **[6]**

c) Draw the structure of a nerve cell and explain synapses. **[6]**

OR

Q2) a) Explain Einthoven's triangle? Explain its significance with help of neat sketch. **[8]**

b) Explain Pan Tomkins algorithm for QRS detection in an acquired ECG signal. **[6]**

c) Draw the structure of a nerve cell and explain synapses. **[6]**

Q3) a) Draw & explain structure of brain. **[8]**

b) Explain EEG rhythms & waveform. Also explain categorization of EEG activity & its recording techniques. **[8]**

OR

P.T.O.

Q4) a) Explain Low Pass and High Pass Integer Filters with their basic design concept in detail. **[8]**

b) Draw and explain the block diagram for Brain computer interface. **[8]**

Q5) a) Explain how Fourier Transform in EEG Signal Analysis. **[8]**

b) Explain Adaptive Filters with its basic concept. Also explain principle noise cancellation model of the same. **[8]**

OR

Q6) a) State the Weiner Hopf equation. Explain the with equations the least mean square approach to find the filter coefficients. **[8]**

b) Explain the concept of Low pass filtering and high pass filtering with respect to biosignals. **[8]**

Q7) a) Explain QRS detection using Multivariate analysis method ICA. **[10]**

b) Explain how FIR or IIR filters are used specifically for event detection in ECG. **[8]**

OR

Q8) a) State the difference between stationary and non-stationary signals. Support the answer with relevant application to biomedical domain. **[10]**

b) State the PCA algorithm and its significance. **[8]**

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