Total No. of Questions : 8]

SEAT No. :

P3107

[Total No. of Pages : 2

[5354]-598
B.E. (Electronics Engineering)
BIOMEDICAL SIGNAL PROCESSING
(2012 Pattern)

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 the function of central nervous system. **[6]**

b) Draw a schematic representation of Einthoven's triangle showing the directions of leads I, II, and III of the ECG signal. Derive the relationship between the three leads I, II, and III using vectorial arithmetic. **[8]**

c) Explain the structure and function of neuron. **[6]**

OR

Q2) a) Write brief notes on Bio-Potential Electrode? What happens if electrodes are either placed dry or loose? **[8]**

b) Write short note on active and passive transducers used in biomedical system. **[6]**

c) Lead I amplitude is 5mm, Lead II = 9mm with calibration of 10mm/mV. Speed is 50mm/mV find Lead III, aVR, aVL and aVF value. **[6]**

Q3) a) Draw block diagram of EEG machine. Explain in detail. **[8]**

b) List out the applications of EEG and explain in brief sleep disorder. **[8]**

OR

Q4) a) Draw and explain 10-20 electrodes system for EEG Recording. **[8]**

b) Explain with block EEG data acquisition system. **[8]**

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Q5) a) Explain different grounding technique used in medical instruments. **[8]**

b) Write requirement of basic amplifier and Explain the use of Instrumentation amplifier. **[8]**

OR

Q6) a) Explain the concept for design of LPF and HPF and its application in Biomedical Field. **[8]**

b) What is adaptive filter? Explain the principle noise cancellation model. **[8]**

Q7) a) Design a frequency domain filter to remove high frequency noise with minimal loss of signal component in specified pass-band. **[10]**

b) Explain the selection criteria of filter for biomedical application. **[8]**

OR

Q8) a) State sampling theorem and how it is used in data acquisition of ECG. **[10]**

b) Write brief notes on characterization of non-stationary signal. **[8]**

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