Total No. of Questions : 8]

SEAT No. :

P4301

[Total No. of Pages : 2

[4960] - 225

M.E. (E&TC) (VLSI & Embedded Systems)

BIO-MEDICAL SIGNALS & SYSTEMS

(2008 Pattern) (Elective - III) (Semester - II)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagram must be drawn wherever necessary.***
4) ***Figure to the right indicates full marks.***
5) ***Use of logarithm table slide rules, pocket calculator is allowed.***
6) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) What are the objectives of Bio-medical signal analysis? What are the difficulties encountered with acquisition and analysis of Bio-medical signal? **[10]**

b) Explain cross and auto correlation function. How correlation functions are useful in analyzing signal. **[8]**

Q2) a) Compare between Time Domain filters and Frequency Domain filters and which are commonly used filter. **[8]**

b) Explain timing varying analysis of heart rate variability. **[8]**

Q3) a) Explain the use of Adaptive filter for segmentation of EEG signal. **[8]**

b) Explain different measures derived from power spectral density function. **[8]**

Q4) a) How to select appropriate filter to remove noise and interference? **[6]**

b) Design a Butterworth low pass filter with Fc = 1 kHz, Fs = 10,000 samples/sec N = 2. **[10]**

P.T.O.

SECTION - II

Q5) a) What is Neural Network? How it can be used for Bio-medical application? Gives example. Draw Signal cell or Node for NN. Explain all connection towards and away from node. **[10]**

b) Explain in detail Adaptive segmentation and fixed segmentation. **[8]**

Q6) a) What is supervised pattern classification? Explain various supervised Algorithm. **[10]**

b) What is Bay's classifier for normal pattern? **[6]**

Q7) a) Suggest an approach to remove muscle contraction interference from knee joint vibration signal. **[8]**

b) What is logistic regression analysis? When to use logistic regression analysis? Which are the different application of logistic regression analysis? **[8]**

Q8) a) Draw ECG wave form and give normal value of amplitude & duration of important ECG Parameter. Explain matched filter in detection of P wave. **[8]**

b) Explain Homomorphic filtering for ECG Rhythm Analysis & identification of Heart sounds. **[8]**

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