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06EC834

Eighth Semester B.E. Degree Examination, June / July 2014
Biomedical Signal Processing

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. What are the different types of biomedical signals? Explain ECG, EEG, Speech signal. (12 Marks)
 b. Explain briefly objectives and difficulties in biomedical signal analysis. (08 Marks)
- 2 a. What are the different types of electrodes? (06 Marks)
 b. Explain in detail classification of electrodes in a 12-lead ECG system. (06 Marks)
 c. Explain briefly the physiology of the heart and elaborate on how action potentials propagate through the heart giving rise to different segments of ECG. (08 Marks)
- 3 a. What is digital filter? What are the elements of digital filter? Mention advantages and disadvantages of digital filters over analog filters. (10 Marks)
 b. Explain briefly the z-plane pole zero plot with example. (10 Marks)
- 4 a. What are the advantages of an adaptive filter? Design an adaptive filter using LMS algorithm. (10 Marks)
 b. Discuss briefly the different applications of adaptive filters. (10 Marks)

PART – B

- 5 a. Explain about the basics of signal averaging and its characteristics. (08 Marks)
 b. Explain how signal averaging as a digital filter. (06 Marks)
 c. With a neat block diagram, explain a typical signal averager. (06 Marks)
- 6 a. Explain about the turning point algorithm. (08 Marks)
 b. What is adaptive coding scheme? (06 Marks)
 c. Explain briefly FAN algorithm. (06 Marks)
- 7 a. Explain briefly the QRS detection algorithm. (08 Marks)
 b. What are the different types of template matching techniques? Explain any two template matching techniques. (12 Marks)
- 8 Write short notes on:
 - a. VLSI applications in medicine.
 - (i) Portable ECG machine. (06 Marks)
 - (ii) Digital hearing aid. (06 Marks)
 - b. Arrhythmia analysis. (06 Marks)
 - c. Parallel processing and bit serial processing VLSI architectures. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.