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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; May / June - 2019

Biomedical Signal Processing

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1	a.	Briefly describe the objectives of biomedical signal processing.	6
	b.	Explain the basic ECG with a neat sketch of P, QRS and T waves.	10
	c.	Discuss any four difficulties involved in biomedical signal analysis and acquisition.	4
2	a.	Describe the events and transients that occur in EEG signals.	10
	b.	Briefly describe the maternal interference in fetal ECG.	6
	c.	Discuss briefly with a neat diagram, time variant vocal tract fitter system.	4

UNIT - II

3	a.	Illustrate how moving average filter technique can be used to remove random noise from a given signal.	10
	b.	Develop a time domain technique to remove base line drift in ECG signal.	10
4	a.	Discuss how Butterworth low pass filters are used to remove high frequency noise with minimal loss signal component in the specified pass band.	10
	b.	Design a frequency domain filter to remove periodic artifacts such as power line interference.	10

UNIT - III

5	a.	Illustrate adaptive implementation of Wiener filter with block diagram and discuss the issues involved in adaptive implementation.	10
	b.	Explain LMS algorithm with a neat signal flow garph.	10
6	a.	With a neat flow chart discuss CORTES data compression algorithm.	10
	b.	Illustrate data compression using DPCM with neat block diagram.	10

UNIT - IV

7	a.	Explain Levinson's algorithm for EEG analysis.	12
	b.	Discuss time and frequency domain methods for EEG analysis.	8
8	a.	With a process flow diagram, explain high speed QRS detection algorithm.	10
	b.	With a neat block diagram, explain microprocessor based ECG recording system.	10

UNIT - V

9	a.	With the help of single exponent case describe Prony's model.	8
	b.	Explain original Prony problem and the computations steps.	12
10	a.	Derive an expression for least square Prony method .	10
	b.	Briefly descirbe clinical application of Prony's method by considering suitable example.	10

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