

U.S.N.

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations**Programme: B.E.****Branch: Medical Electronics Engineering****Course Code: 22MD6PCBSP****Course: BIOMEDICAL SIGNAL PROCESSING****Semester: VI****Duration: 3 hrs.****Max Marks: 100**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			UNIT - I	CO	PO	Marks
	1	a)	What are several Statistical preliminaries, key concepts and techniques that involved in bio signal processing?	CO1	PO1	06
		b)	Provide examples or scenarios where Moving Average filters are particularly effective in processing specific types of bio signals.	CO1	PO1	06
		c)	Explain adaptive noise canceller for elimination of interferences.	CO1	PO1	08
			UNIT - II			
	2	a)	Explain ECG Data Reduction using Turning point technique.	CO2	PO1	10
		b)	Describe AZTEC Compression. And let illustrate how an Amplitude Zone Time Epoch Coding (AZTEC) encodes a signal as {12, 80, 7, 100, -6, -120, -6, 125, 25, 150}. How many data points were originally sampled?	CO2	PO2	10
			OR			
	3	a)	Illustrate FAN algorithm for ECG data reduction.	CO2	PO1	10
		b)	Explain how Huffman coding can be applied to reduce the size of bio signal data for efficient storage and transmission without compromising diagnostic accuracy.	CO2	PO2	10
			UNIT - III			
	4	a)	With a relevant equations and sketches illustrate Pan-Tompkin's method of QRS detection.	CO3	PO1	10
		b)	Discuss the ST segment of a cardiac cycle for the analysis of cardiac diseases.	CO3	PO1	10
			UNIT - IV			
	5	a)	Characterize the Auto- Regressive (AR) parameters (prediction coefficients) obtained from a third linear predictor.	CO4	PO2	10

	b)	Examine how transients are detected and eliminated for epileptic patients.	CO4	PO1	10
		UNIT - V			
6	a)	Explain characteristics of EEG for various sleep stages and draw the EEG waveforms.	CO5	PO1	10
	b)	Discuss about the dynamics of sleep wake transitions.	CO5	PO1	10
		OR			
7	a)	Analyze hypnogram model parameters.	CO5	PO1	06
	b)	How to investigate sleep EEG signal based on frequency band?	CO5	PO1	06
	c)	Obtain an expression for the probability that the random variable X in a Markov process will change its state from x_i to x_m in three steps given that the system has n states.	CO5	PO1	08
