



Roll No:

BTECH

(SEM. VIII) THEORY EXAMINATION 2025-26

BIO MEDICAL SIGNAL PROCESSING

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

02 x 7 = 14

Q. no.	Question	CO	Level
a.	List any two types of biomedical signals.	1	K1
b.	Explain the QRS complex in brief.	2	K2
c.	What is baseline wander?	2	K1
d.	Explain run-length coding in brief.	3	K2
e.	What is data reduction?	3	K1
f.	If the EEG signal power increases from $5\mu V^2$ to $20\mu V^2$ during a seizure event, calculate the percentage increase in power.	4	K3
g.	What is the LMS algorithm?	5	K1

SECTION B

2. Attempt any three of the following:

07 x 3 = 21

Q. no.	Question	CO	Level
a.	Define biomedical signals and classify them based on their origin and characteristics.	1	K4
b.	Explain ST-segment analysis and its importance.	2	K5
c.	Given symbols with probabilities: A: 0.4, B: 0.2, C: 0.2, D: 0.1, E: 0.1. Construct the Huffman code and calculate the average code length.	3	K6
d.	Discuss methods for epilepsy detection and estimation using EEG signals.	4	K5
e.	Explain EP estimation using signal averaging.	5	K5

SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain the working principle of Electroencephalography (EEG).	1	K5
b.	Discuss the major difficulties encountered during signal acquisition.	1	K6

4. Attempt any one part of the following:

07 x 1 = 07

Q. no.	Question	CO	Level
a.	Discuss techniques for the removal of baseline wander and power line interference.	2	K6
b.	Interpret how amplitude and time intervals (PR interval, QRS duration, QT interval) are measured from an ECG signal.	2	K5



Paper ID : 260679

Printed Page: 2

Subject Code:BOE083

Roll No:														
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH

(SEM. VIII) THEORY EXAMINATION 2025-26

BIO MEDICAL SIGNAL PROCESSING

TIME: 3 HRS

M.MARKS: 70

5. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain the fan algorithm for signal compression.	3	K5
b.	Compare AZTEC with the Turning Point algorithm. Given the signal samples: $x[n] = [2, 5, 3, 6, 4, 7, 5]$. Apply the Turning Point algorithm and determine the reduced data sequence.	3	K4

6. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain the concept of linear prediction theory in EEG signal analysis.	4	K5
b.	Compare different EEG analysis techniques.	4	K4

7. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Analyze adaptive noise cancellation techniques.	5	K4
b.	Explain the general structure of an adaptive filter with a neat block diagram.	5	K5