



# MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

## Department of Biomedical Engineering Question Bank - Academic Year (2021-22)

Course Code & Course Name : 19BMC13 & Medical Signal Processing

Year/Sem/Sec : III/V

### UNIT I : ADAPTIVE FILTERS

#### Part-A (2 Marks)

1. Define adaptive filter.
2. How we can cancel the high frequency noise in Electro surgery.
3. What do you mean by Electrocardiographic Artefacts?
4. What is the limitation of steepest descent algorithm?
5. What do you mean by filter?
6. What is motion artifact in ECG?
7. Define Precordial Thump.
8. How do you remove artifacts from ECG?.
9. What are the effects of motion artefact.
10. Discuss briefly any one application of adaptive filter

#### Part-B (16 Marks)

1. Explain about types of adaptive algorithm
2. Explain the procedure followed in cancelling donor heart adaptive filters.
3. How to cancel high frequency noise in Electro surgery
4. Explain about the ECG noise cancellation using Digital filters.
5. Explain artefacts with its examples.

### UNIT II : DATA COMPRESSION TECHNIQUES

#### Part-A (2 Marks)

1. Mention the uses of data compression.
2. Why is data compression is important.
3. Difference between Lossy and Lossless compression.
4. What are the steps involved in Turning Point algorithm.

5. Define Compression Ratio.
6. Write the advantage and disadvantages of data compression.
7. How do data compression algorithms work?
8. What is the use of FAN algorithm?
9. What is data acquisition in medical?
10. Justify the sentence –ECG is used for cardiac measurement.

**Part-B (16 Marks)**

1. What is Data Compression .Explain in detail about its types.
2. Explain in detail about Turning point algorithm.
3. Explain the following :  
(i)List the differences between lossless and lossy data compression techniques.  
(ii) Why data compression is important ?
4. Explain about AZTEC decoding Algorithm.
5. Explain about Fan decoding Algorithm

**UNIT III : CARDIO-LOGICAL SIGNAL PROCESSING**

**Part-A (2 Marks)**

1. What is the normal frequency of ECG signal.
2. Give the comparison of QRS detection methods in terms of parameter.
3. Give the basic principle used in ECG.
4. What are the parameters of ECG?
5. How we measure amplitude in ECG .
6. Differentiate between general purpose microprocessors and DSP.
7. Explain the classification of Bio medical signals
8. What is QRS complex?
9. What are the different types of lobes present in our brain?
10. Define Rhythmic analysis.

**Part-B (16 Marks)**

1. Explain about ECG QRS detection techniques and its estimations.
2. Explain about the Rhythm analysis.
3. Explain about the Arrhythmia analysis
4. Explain the proposed method QRS Detection using Multiwavelet transform technique
5. Explain about basic electrophysiology of heart.

## UNIT IV : NEUROLOGICAL SIGNAL PROCESSING

### Part-A (2 Marks)

1. Define adaptive segmentation.
2. List out the Applications of AR method.
3. What do you mean by spectral error.
4. Define AR parameters.
5. Explain the block diagram of biomedical signal analysis.
6. What are the dominant frequencies in sleep EEG and their nomenclature?
7. Define EEG?
8. How to measure Spectral Error ?
9. Define Linear Prediction.
10. Mention the frequency at which EEG is done?

### Part-B (16 Marks)

1. Explain about the Linear prediction theory.
2. Explain about the AR method
3. Explain the EEG Transient detection and elimination in epileptic patients and its overall performance.
4. Discuss about Recursive estimation of AR parameters and calculate the spectral error.
5. Explain about Adaptive Segmentation.

## UNIT V : SLEEP EEG

### Part-A (2 Marks)

1. Define Data acquisition.
2. State the principle used in Markov model.
3. List the Application of EEG.
4. Give the classification of sleep stages.
5. What is ARMA ?
6. Give the methods of EEG analysis .
7. What is the use of measurement in amplitude in EEG?
8. What does a sleep EEG show?
9. Is EEG better the MRI? Justify your answer.
10. Mention the classification of sleep EEG.

### Part-B (16 Marks)

1. Discuss the following
  - i. Data acquisition
  - ii. Hypnogram model parameters.

2. Explain about the Markov model .
3. Explain about the Markov chain
4. Explain about the Dynamics of sleep-wake transitions
5. Explain about the Event history analysis for modeling sleep.

**Course Faculty**

**HoD**

