

# GBCS SCHEME

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18E1742

## Seventh Semester B.E. Degree Examination, Feb./Mar. 2022 Biomedical Signal Processing

Time: 3 hrs.

Max. Marks: 100

**Note:** Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Explain in brief for the objectives of biomedical signal analysis. (10 Marks)  
b. With a neat diagram, explain for the computer aided diagnosis. (10 Marks)

OR

- 2 a. With a neat diagram, explain for the electrophysiological origin of brain waves. (10 Marks)  
b. Explain in brief about the Autoregressive Method (AR). (10 Marks)

### Module-2

- 3 a. Explain in brief about stationary versus non-stationary process for Artifacts Removal. (10 Marks)  
b. Explain in brief about time domain filters with applications. (10 Marks)

OR

- 4 a. Explain in brief for the removal of high frequency noise by Butterworth low pass filter. (10 Marks)  
b. Explain in brief for the Removal of periodic artifacts by notch and comb filters. (10 Marks)

### Module-3

- 5 a. With neat diagram explain for the basics of signal Averaging. (10 Marks)  
b. With neat diagram explain for the typical Averager. (10 Marks)

OR

- 6 a. With relevant diagram explain for the Markov model and Markov chains. (10 Marks)  
b. Explain in brief for dynamics of sleep wave transitions. (10 Marks)

### Module-4

- 7 a. With a neat diagram explain for the principles of an adaptive filters. (10 Marks)  
b. Explain in brief for the cancellation of 60Hz interference in ECG. (10 Marks)

OR

- 8 a. With a neat diagram explain for the cancellation of electrocardiographic signals from the electrical activity of chest muscles. (10 Marks)  
b. With a neat diagram, explain for the cancellation of higher frequency noise in electro-surgery. (10 Marks)

### Module-5

- 9 a. Explain in brief for the direct ECG data compression techniques. (10 Marks)  
b. With a neat diagram explain for the CORTES algorithm. (10 Marks)

OR

- 10 a. With a neat diagram explain the Differential Pulse Code Modulation (DPCM) of other data compression technique. (10 Marks)  
b. Explain in brief about the data compression techniques comparison. (10 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.