Total No. of Questions – [9] Total No. of Printed Pages: 02

G.R. No.	

P118 – 143 (ESE)

DEC 2018 / End - SEM)

F. Y. M. TECH. (E&TC) (SEMESTER -I)

COURSE NAME: Biomedical Signal Processing

COURSE CODE: ETPA11183C

(PATTERN 2018)

Time: [3.0 Hours] [Max. Marks: 50]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) i) Draw a neat labeled diagram of ECG signal and write the diagnostically important feature points with their time and amplitude [3 marks]

OR

ii) List the various frequency ranges in EEG waveforms and explain their significance in diagnosing brain disorders. [3 marks]

Q.2) i) Explain shielding techniques implemented for electrical safety of Medical Instruments. [3 marks]

OR

ii) Explain the benefits of using digital filters in biomedical signal processing [3 marks]

Q.3) i) Explain STFT. Discuss its short comings [2 marks]

OR

ii) List the various features in frequency domain that can be useful in biomedical signal processing. [2 marks]

Q.4) i) What type of noise sources can contaminate the bio-signals. [6 marks]

ii) Discuss advantages of stationary and non-stationary signals. [4 marks]
iii) What are edge effects? How can they be eliminated? [4 marks]

OR

Q.5) i) Differentiate between FIR and IIR filters [6 marks]

ii) How adaptive noise cancellation technique can be implemented in removal of noise [8 marks]

Q.6) i) Explain application of Wavelet Transform in Biomedical signal analysis [6 marks]

ii) Compare PCA and ICA [8 marks]

OR

Q.7) i) Explain PCA algorithm with suitable example. [6 marks]

ii) Write a note on application areas of Bio-signal analysis [8 marks]

Q.8) i) Draw and explain the steps involved in Biomedical signal processing [6 marks]

ii) Generate OR function using McCulloh-Pitts neuron model [8 marks]

OR

Q.9) i) What do you understand by supervised and unsupervised learning [6 marks]

ii) State the methods for detection of QRS complex. Draw flowchart for Pan Tomkins Algorithm technique [8 marks]