

B.Tech. SEM -V Bio Medical 2014 Course (CBCS) : SUMMER - 2019
SUBJECT: BIOMEDICAL DIGITAL SIGNAL PROCESSING

Day: Tuesday
Date: 14/05/2019

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

S-2019-2698

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagrams **WHEREVER** necessary.

Q.1 What is the need of signal conversion? With the help of a block diagram explain a typical analog-to-digital signal conversion process. (10)

OR

Q.1 a) State and explain sampling theorem with suitable example. (05)

b) With a neat block diagram explain successive approximation technique. (05)

Q.2 Define finite impulse response filter (FIR) and explain in detail characteristics of FIR filter. (10)

OR

Q.2 a) Distinguish between FIR and IIR filter. (05)

b) Describe in detail bilinear transformation of an IIR filter. (05)

Q.3 Explain the importance of data reduction in signal processing. Also describe in detail turning point algorithm for data reduction. (10)

OR

Q.3 a) Explain the concept of adaptive coding in detail. (05)

b) Describe the data reduction for the amplitude zone time epoch coding. (05)

Q.4 Define Fourier transform. Explain in detail properties of DFT. (10)

OR

Q.4 a) Write a note on auto correlation and cross correlation. (05)

b) Define convolution. Compute the convolution of following sequence. (05)

$$x(n) = \{1, 0, 1, 2\} \quad ; \quad h(n) = \{1, 2, 1\}$$

Q.5 Describe in detail various filtering techniques for ECG QRS detection. (10)

OR

Q.5 a) Explain differentiation technique for ECG QRS detection. (05)

b) Explain the use of low pass filter in QRS detection algorithm. (05)

Q.6 Explain in detail portable arrhythmia monitor software design. (10)

OR

Q.6 a) With the help of a block diagram explain steps in ECG interpretation. (05)

b) Explain the need of analyzing ECG, EEG and EMG signals. (05)

* * * *