

**B.TECH. SEM -V BIO MEDICAL 2014 COURSE (CBCS) : WINTER -
2017**

SUBJECT: BIOMEDICAL DIGITAL SIGNAL PROCESSING

Day : **Thursday**
Date : **18/01/2018**

Time : **02.30 PM TO 05.30 PM**
Max. Marks: 60

W-2017-2170

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.

Q.1 With the help of neat block diagram explain the operation of Flash type analog to digital converter. (10)

OR

Q.1 a) Describe the operation of voltage scaling D to A converter. (05)
b) State and explain Sampling theorem. (05)

Q.2 List the advantages of adaptive filters. Describe in detail the any one application of adaptive filter (10)

OR

Q.2 a) Compare FIR & IIR Filters. (05)
b) Write a comprehensive note on MIT database. (05)

Q.3 What is the basic principle of static Huffman coding? Explain in detail. (10)

OR

Q.3 a) Define and explain Discrete Wavelet Transform. (05)
b) What is the necessity of data reduction techniques in medical signal processing systems? (05)

Q.4 With neat butterfly diagram explain the Radix-2 DIF-FFT algorithm. (10)

OR

Q.4 a) Compute autocorrelation for the following sequence. (05)
 $x(n) = \{1, 3, 5, 7\}$
b) Describe the properties of DFT. (05)

Q.5 Explain the detection of QRS complex from an ECG signal using template cross correlation. (10)

OR

Q.5 a) Explain real time QRS detection algorithm with block diagram. (05)
b) Derive power spectrum estimation in biomedical signal processing. (05)

Q.6 With a neat block diagram explain the interpretation of 12- lead ECG signal. (10)

OR

Q.6 a) Describe ECG measurements made by ST segment analyzer. (04)
b) Explain the function of each block in portable arrhythmia monitor. (06)