

B.Tech. SEM -V Bio Medical 2014 Course (CBCS) : WINTER - 2018
SUBJECT: BIOMEDICAL DIGITAL SIGNAL PROCESSING

Day: Thursday
Date: 29/11/2018

W-2018-2433

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

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat diagrams **WHEREVER** necessary.
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Q.1 State sampling theorem. Explain in detail different techniques of digital-to-analog conversion process. **(10)**

OR

Q.1 a) Explain the principle of voltage scaling and charge scaling w. r. t. D/A converter. **(05)**

b) Describe in detail dual slope analog-to-digital converter circuit. **(05)**

Q.2 Explain in detail different types of smoothing filters in FIR. **(10)**

OR

Q.2 a) Explain in detail applications of adaptive filtering. **(05)**

b) Explain impulse invariance method for the design of IIR filters. **(05)**

Q.3 Describe Huffman coding. Explain in detail static and dynamic Huffman coding. **(10)**

OR

Q.3 a) Explain adaptive coding. **(05)**

b) Define wavelet. Explain in detail discrete wavelet transform. **(05)**

Q.4 Compute DFT using DIT-FFT algorithm **(10)**
 $x(n) = \{1, 1, 1, 1, -1, -1, -1, -1\}$

OR

Q.4 a) Compare the computational complexity of FFT with DFT algorithm. **(05)**

b) Explain in detail convolution and correlation techniques. **(05)**

Q.5 With the help of a block diagram explain in detail QRS detection algorithm. **(10)**

OR

Q.5 a) Describe template cross correlation technique to classify patterns in the ECG signal. **(05)**

b) Write a note on : **(05)**
i) Two-pole recursive filters **ii)** Integer filter for detection of QRS complex.

Q.6 Explain in detail interpretation of 12-lead ECG. **(10)**

OR

Q.6 a) With a neat diagram, explain ST-segment analyzer. **(05)**

b) With the help of a block diagram explain portable arrhythmia monitor. **(05)**

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