

**B.TECH. SEM -VII ELECTRICAL 2014 COURSE (CBCS) : WINTER
- 2017**

SUBJECT: ELECTIVE – III: DIGITAL SIGNAL PROCESSING

Day: **Wednesday**
Date: **17/01/2018**

W-2017-2288

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 and labeled diagram **WHEREVER** necessary.
- 4) Use of non programmable **CALCULATOR** is allowed.
- 5) Assume suitable data if necessary.

Q.1 a) Explain the classification of signals. **[05]**

b) State and explain Sampling theorem and Nyquist rate **[05]**

OR

Sketch the following non-periodic signals: **[10]**

- i)** Unit impulse function
- ii)** Unit step function
- iii)** Unit Ramp function

Q.2 Define symmetry of the functions. Give an example of ODD and even symmetry. **[10]**

OR

Write down any four properties of z transform with an example. **[10]**

Q.3 Explain the following frequency selective filters. **[10]**
i) High pass filter **ii)** Low pass filter

OR

Define stability and causality functions of LTI systems. **[10]**

Q.4 Explain circular convolution. How circular convolution can be obtained using DFT and IDFT? **[10]**

OR

Determine the length of 4 sequence from its DFT $x(k) = \{4, 1, -j, -2, 1 + j\}$ **[10]**

Q.5 a) Compare IIR and FIR filters. **[05]**

b) Explain FIR filter design with rectangular window. **[05]**

OR

Write down the advantages and disadvantages of Digital Filter. **[10]**

Q.6 Draw and explain the block diagram and signal flow graph representation of LCCDE. **[10]**

OR

Obtain system function $H(z)$ for $b(n) = \{4, 2, -2, -3\}$ and draw a direct form FIR filter structure. **[10]**