

# END TERM EXAMINATION

FIFTH SEMESTER [B.TECH./M.TECH.] DEC. 2014-JAN. 2015

Paper Code: IT307

Subject: Digital Signal Processing

Time : 3 Hours

Maximum Marks :60

Note: Attempt any five questions including Q.no.1 which is compulsory.

- Q1 Explain the following briefly:- (2x10=20)
- (a) Give the properties of Z-transformation.
  - (b) What is signal processing?
  - (c) Give some properties of DFT.
  - (d) Differentiate between FIR and IIR.
  - (e) Define Convolution.
  - (f) Why do we need FFT algorithms?
  - (g) What are the computational saving in using N point FFT algorithm?
  - (h) What are the advantages of FIR filters?
  - (i) Differentiate between DIT and DIF.
  - (j) Give some applications of DSP.
- Q2 (a) What are typical signals? Give some examples of typical signal. (5)  
(b) Explain the time-domain LTI system with an example. (5)
- Q3 (a) Discuss the design procedure of FIR filter using frequency sampling method. (6)  
(b) Give the block diagram representation of digital filter. (4)
- Q4 (a) Derive the butterfly diagram of 8 point radix 2 DIF FFT algorithm and fully label it. (6)  
(b) How can we classify signals? (4)
- Q5 (a) Compute linear convolution of the two sequence  $x(n)=\{1,2,2,2\}$  and  $h(n)=\{1,2,3,4\}$ . (6)  
(b) Derive expressions to relate z-transfer and DFT. (4)
- Q6 (a) State and explain the scaling and time delay properties of z transform. (5)  
(b) Describe different types of sampling methods. (5)
- Q7 (a) Explain the classification of discrete signals. (4)  
(b) Determine the response of LTI system when the input sequence is  $x(n)=\{-1,1,2,1,-1\}$  using radix 2 DIF FFT. The impulse response is  $h(n)=\{-1,1,-1,1\}$ . (6)
- Q8 (a) Give some approaches of reducing the computation of an algorithm. (4)  
(b) An 8 point sequence is given by  $x(n)=\{2,2,2,2,1,1,1,1\}$ . Compute 8 point DFT of  $x(n)$  by radix DIT-FFT method. (6)