Total No. of Questions : 8] *[Total No. of Printed Pages : 3*

Roll No .....

EC-6002 (CBGS)

B.E. VI Semester

Examination, May 2018

Choice Based Grading System (CBGS)

Digital Signal Processing

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Describe stability and causality in continuous time domain with necessary and sufficient condition. 7

   b) Draw a simple RC circuit and analyse it for stability. 7

2. a) Describe the properties of Z-transform. 7

   b) Consider a CTS with following T.F and find its T.F in discrete domain. 7

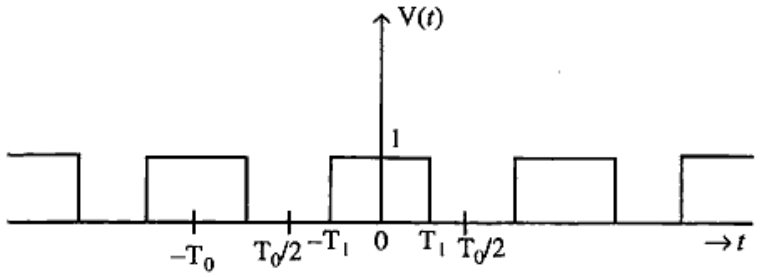
$$H(s)=\frac{2(s+2)}{(s+0.5)(s^2+2s+0.97)}$$

3. a) Describe the role of linear convolution and circular convolution. 7

   b) Determine the output of a system with given T.F and Input. Input = sin 50n 7

$$H(z)=\frac{0.5}{(z+2)(z^2+0.2z+3.9)}$$

4. a) Analyze the given waveform and apply suitable transformation technique to extract the frequency information. 7



   b) Explain the role of Parseval's theorem area in signal processing. What does it signifies? Explain this theorem with suitable example. 7

5. a) How do we determine of find PSD of a signal? Describe it. 7

   b) How we can develop algorithm for 'N' composite number? Explain. 7

6. a) Determine the DFT of the 4-point discrete time sequence $x(n) = \{4, 3, 2, 1\}$ using DFT transportation matrix. Also determine IDFT from DFT. 7

   b) Find the circular convolution of two sequences. 7

$$x_1(n)=\begin{cases}1 & , n=0\\ \frac{1}{2} & , n=1\\ 0 & , \text{otherwise}\end{cases} \quad \text{and} \quad x_2(n)=\begin{cases}\frac{1}{2} & , n=0\\ 1 & , n=1\\ 0 & , \text{otherwise}\end{cases}$$

7. a) Describe Goertzel Algorithm. 7

Or

Distinguish between DIT and DIF algorithm. 7

b) Find the sequence $x(n)$, whose Z-transform is given by $x(z) = \log (1+Az^{-1}), |z| > |A|$ 7

8. a) Discuss the computational complexity involved in Direct computation of DFT. 7

b) Explain different features of Ideal Window. 7

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