*Total No. of Questions : 8]* *[Total No. of Printed Pages : 2*

**Roll No** .....

# EE/EX-3005-CBGS

## B.E., III Semester

Examination, June 2020

## Choice Based Grading System (CBGS)

## Signals and Systems

***Time : Three Hours***

***Maximum Marks : 70***

***Note:*** i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Sketch neat diagram.

1. a) Explain about Linear time invariant systems with some examples. Also state properties of Linear time Invariant systems. 7

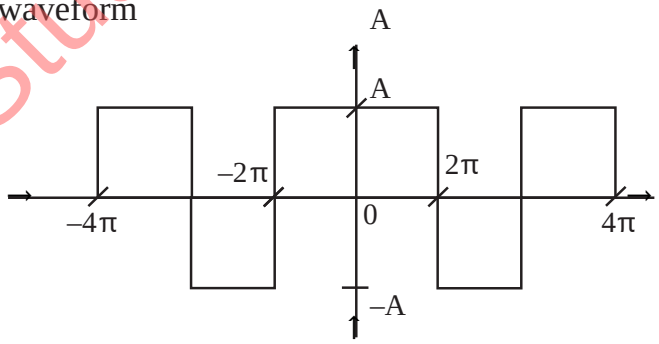
   b) Sketch the following signals: 7

   i) $r(t-1)+2r(t)+r(t+1)$

   ii) $-u(t+1)+7u(t-1)-11u(t-2)$

2. a) Find the Fourier transform of $e^{-3t}\sin w_0 t\, u(t)$. 7

   b) Determine the Fourier series expansion for the given waveform 7



3. a) Explain about state variable representation of systems. 7

   b) Determine the impulse response and step response of 7

$$y(n)+3y(n-6)-2y(n-8)=x(n-2)+2x(n-4)$$

4. a) Find the convolution sum between $x(n)=\{-3,1,2,3\}$ and $h(n)=\{-2,1,0,2\}$. 7

   b) Find the z-transform of 7

$$y(n)=4^n u(n)-2^n u(n-1),\ ROC:|z|<4$$

5. a) Give block diagram representation of linear time invariant discrete time systems and also state their properties. 7

   b) Using properties of z-transform, find z-transform and

   ROC of signal $\dfrac{1}{\left(1-z^{-1}\right)^2}$ 7

6. a) Give some difference between energy and power signals with some examples. 7

   b) State Laplace transform and its properties. 7

7. a) Explain in brief about realizability of linear time invariant continuous time systems. 7

   b) Write about DTFT and its properties. 7

8. Write short notes on: 14

   i) Wavelet transform

   ii) Analog and Digital Filters

   iii) Sampling of continuous time signals

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