PVP 14

Code: EC3T3

II B.Tech - I Semester – Regular/Supplementary Examinations
November - 2019

SIGNALS AND SYSTEMS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) Draw the graphical form of sinc signal sinc(t).
b) Compare Even and Odd signals.
c) Write the mathematical form of frequency convolution property of Fourier Transform.
d) Sketch the spectrum of a signal x(t)=δ(t).
e) What type of system is described by a differential equation.
f) What is the relationship between Z-transform and DTFT.
g) Denote the Fourier Transform of x(-t) if the Fourier Transform of x(t) is X(jω).
h) Determine the time domain representation of a function $X(S) = \frac{1}{S^2}$, Re(s)>0
i) Write the mathematical form of final value theorem of Laplace Transform.
j) What is the ROC of Z-transform of x(n)=u(n)?
k) Sketch aliasing effect with necessary expression.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) Test the causal system y(t)=T{x(t)}=2 x(t)+ 3 for Linearity, Time invariance and Stabilty. 8 M

   b) Describe and sketch the concept of convolution of the following signals. $x(t) = e^{-3t} u(t)$ and $h(t) = t e^{-3t} u(t)$. 8 M

3. a) Compare exponential Fourier series with trigonometric Fourier series. 6 M

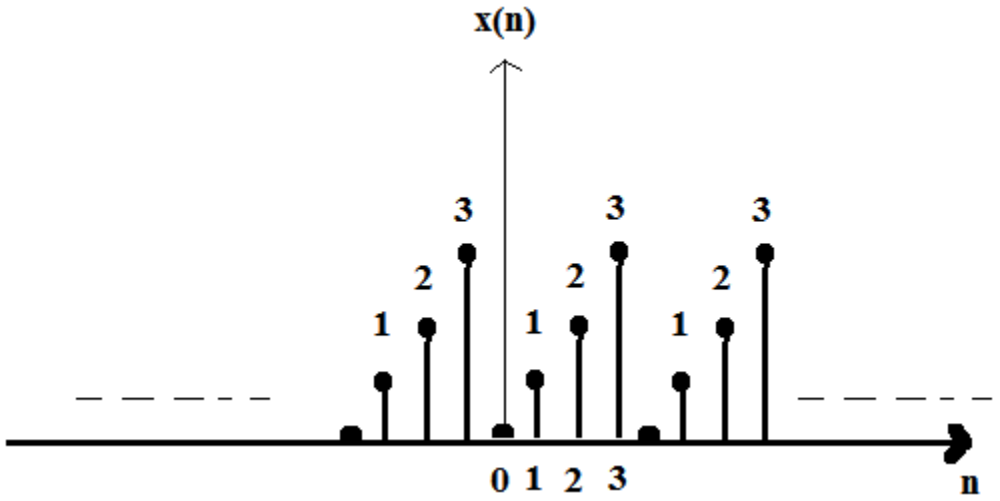
   b) Find the Fourier Transform of a rectangular function of height A and width T i.e. x(t)=A.rect(t/T). 10 M

4. a) State and prove any four properties of Laplace Transform. 8 M

   b) Compute all possible time domain signals corresponds to $X(s) = \frac{s}{(s+1)(s+2)(s+3)}$. 8 M

5. a) Prove time shifting property and frequency shifting property of DTFT. 8 M

b) Given x(n). Find its DTFS and draw magnitude and phase spectrum. 8 M



6. a) Find the z-transform and its ROC of

$x(n)=a^n \sin(\omega_0 n)u(n)$ 8 M

b) State and Prove Sampling Theorem for Band limited signals. 8 M