

Roll No. _____
Total No. of Questions : 9

MAY-2014
B.Tech. (E.C.E.) Sem. 4th
Signals & Systems
Subject Code: BTEC 402
Paper id: A-1190

Total no of page-1

Time: 03 hrs

Instruction to candidates:

1. Section-A is compulsory consisting of ten questions carrying two marks each.
2. section-B contains five questions carrying five marks each and students have to attempt any four questions.
3. Section-C contains three questions carrying Ten marks each and students have to attempt any two questions.

SECTION-A

- Q.1) i) Define LTI Systems.
ii) Differentiate a Causal LTI system from a non causal LTI system.
iii) Describe the linearity property of Discrete Time Fourier Transform.
iv) Explain the concept of region of convergence for Z-transform.
v) Plot the representation of $x[n] = n$ for all n .
vi) Define probability density function.
vii) Explain what is Nyquist rate of sampling and what is the importance of this rate in sampling of a continuous signal.
viii) Write the mathematical expression for continuous Fourier transform of aperiodic signals.
ix) Write the mathematical expression for convolution sum.
x) Define memory less systems.

(2X10=20)

SECTION-B

- Q.2) Define random variables with the help of an example. Also describe discrete random variables and discrete probability distribution. 5
Q.3) Determine the power and the rms value of $f(t) = C \cos(\omega_0 t + \theta)$. 5
Q.4) Find the DTFT of $x[n] = \delta(n-1) + \delta(n+1)$. 5
Q.5) Find the Z-transform of the unit step sequence $x[n] = u[n]$. 5
Q.6) Describe the time-scaling property and time-reversal property of DTFT with the help of one example. 5

SECTION- C

- Q.7) Describe in detail with diagrammatic explanation impulse train sampling. 10
Q.8) Find the mathematical expression for trigonometric Fourier series and derive compact trigonometric series from it. 10
Q.9) Write the applications of following mathematical tools in communication engineering
a) Convolution
b) Continuous time Fourier transform
c) Discrete time Fourier transform
d) Z-Transform 10

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