GANPAT UNIVERSITY
B. Tech. Semester IV (EC)
CBCS Regular Examination April-June 2017
Subject: 2EC401 Signals & Systems

Time: 3 Hours   **Total Marks: 60**

Instructions:
1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
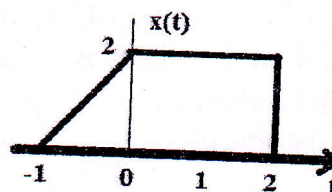4. Assume suitable data, if necessary.

SECTION-I

Que-1	(A)	Compare even function with odd function.	5
	(B)	Give the concept of negative frequency.	5

OR

Que-1	(A)	Find the Fourier transform of the gate function.	6
	(B)	Find inverse Fourier transform of $\delta(w)$.	4

Que-2	(A)	Explain time shifting property of CTFS.	5
	(B)	Explain time shifting property of Fourier Transform.	5

OR

Que-2	(A)	Obtain the DTFT of $\delta[n]$.	5
	(B)	Explain frequency shift property of DTFT.	5

Que-3	(A)	Find Fourier transform of Gaussian pulse given by $x(t)= e^{-(\Pi t^2)}$.	7
	(B)	What do you understand by term spectrum?	3

SECTION-II

Que-4 **(A)** Continuous time signal x (t) shown below. Sketch following basic   5
operation:
    (a) $x(2t+1)$
    (b) $x(-3t+4)$.

    (B) Determine following signals are stable or not and invertible or non-invertible   5
system?
    (1) $y(t)= tx(t)$ (2) $y(t)= e^{x(t)}$

OR

Que-4 **(A)** Find whether the signals are periodic or not? If periodic determine the   5
fundamental period.
    (i) $x(n)=3e^{j3\pi(n+0.5)/5}$ (ii) $x(t)=2cos(10t+1) - sin(4t-1)$

    (B) Find the Even and Odd part for following signals.   5
    (1) $x_1(t) = e^{-2t} cos(t)$ (2) $x_2(t)) = sint + 2sint + 2sintcost$

Que-5 **(A)** Determine the Z-transform of the causal signal $x(n)=a^n u(n)$ and   Ramp   5
signal.

    (B) List the Properties of ROC in z transform and Determine the Z-   5
transform of the finite sequence $x(n)= \{1,2,4,5,0,7\}$.

OR

Que-5 **(A)** Explain and prove the following properties of convolution   5
integral:
    (a) Distributive property
    (b) Associative property.

    (B) Find the convolution of x (t) with h (t).   5
    $x(t)= 3cos2t$; $h(t)= e^{-|t|} =\{ e^{-t}$ for $t>=0$ and e^t for <0.

Que-6 **(A)** Show that   5
    (a) The convolution of an odd and even function is an odd
function.
    (b) The convolution of two odd functions is an even function.

    (B) Determine the output response y(n) using Tabular method   5
    $x(n)= \{ 1, 4, 1, 2\}$; $h(n)=\{ 1, 3,3,6\}$;

END OF PAPER