*Department of Electronics & Communication*

**NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR**

**MIDTERM EXAMINATION**

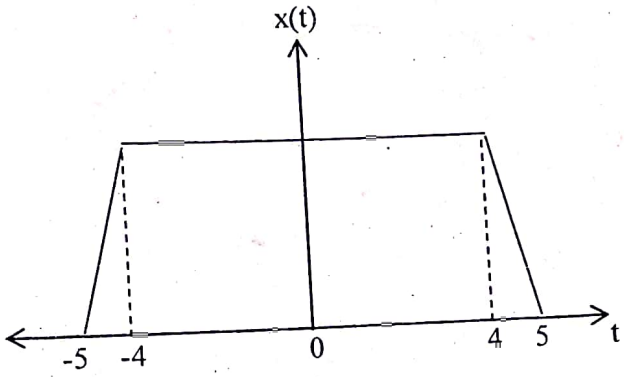
**Course: Signals &Systems**
**Semester: 3rd**
**Date:03/10/18**

**Time: 1.5hrs**
**Max. Marks:30**
**Code: ECE- 303**

**Attempt all the questions**

**Q1.** **(a)** Define signal. Give the general classification of signals. **[3]**

**(b)** Find energy of the following signal:




$$x(t) = \begin{cases} t+5 & for\ -5 \le t \le -4 \\ 1 & for\ -4 \le t \le 4 \\ -t+5 & for\ 4 \le t \le 5 \end{cases}$$

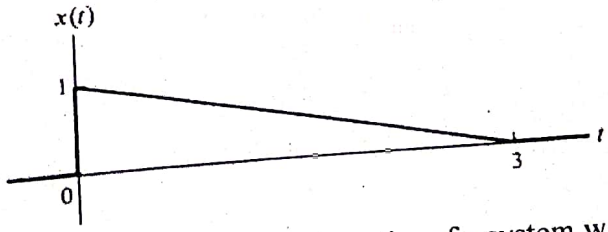
**[4]**

**(c)** Find even & odd components of each of the following signal: **[3]**

$$x(t) = \cos t + \sin t + \sin^2 t$$

**Q2.** **(a)** For x(t) indicated in the figure, sketch the following:

i. x(-t)
ii. x(t+2)
iii. x(2t+2)
iv. x(1-3t)




**[4]**

**(b)** Define System. Explain the following properties of a system with suitable examples: **[6]**

i. Causality
ii. Time Invariance
iii. Linearity

**Q3.** **(a)** Define Convolution. Explain its physical significance in signal processing. [4]

**(b)** Find the Convolution sum of following signals:

i. $h[n]=a^n u[n]$ where $0<a<1$
$x[n]= u[n]$

ii. $h[n] = \{1, \underset{\uparrow}{2}, 1, -1\}$

$x[n] = \{\underset{\uparrow}{1}, 2, 3, 1\}$