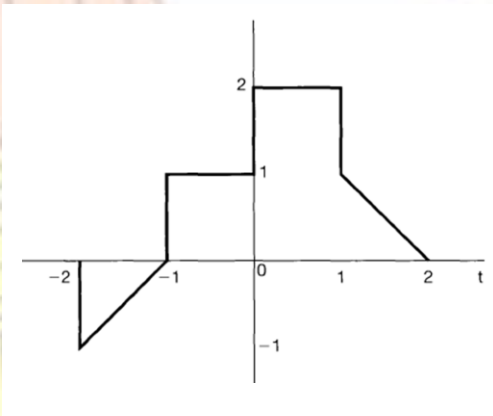
JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY

Electronics and Communication Engineering

Signals and Systems (18B11EC214) - 2020 ODD-SEM

TUTORIAL-1

Q.1 A continuous-time signal *x(t)* is shown in Figure. Sketch and label carefully each of the following signals: **CO1**



(a) $x(t-1)$

(b) $x(2-t)$

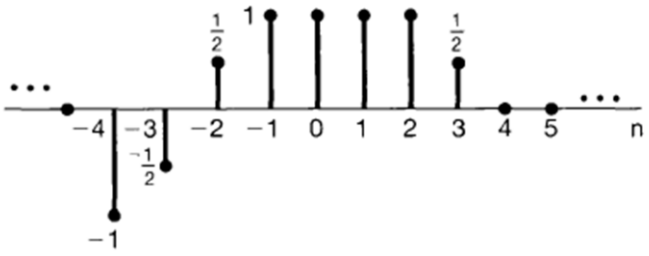
(c) $x(2t+1)$

(d) $x\left(4-\frac{t}{2}\right)$

(e) $[x(t)+x(-t)]u(t)$

(f) $x(t)\left[\delta\left(t+\frac{3}{2}\right)-\delta\left(t-\frac{3}{2}\right)\right]$

Q.2 A discrete-time signal is shown in Figure. Sketch and label carefully each of the following signals: **CO1**



(a) $x[n-4]$

(b) $x[3-n]$

(c) $x[3n]$

(d) $x[3n+1]$

(e) $x[n]u[3-n]$

(f) $x[n-2]\delta[n-2]$

(g) $\frac{1}{2}x[n]+\frac{1}{2}(-1)^n x[n]$

(h) $x\left[(n-1)^2\right]$

Q.3 Determine whether or not each of the following signals is periodic: **CO1**

(a) $x_1(t) = 2e^{j(t+\pi/4)}u(t)$

(b) $x_2[n] = u[n] + u[-n]$

Q.4 Determine whether or not each of the following signals is periodic. If a signal is periodic, specify its fundamental period. **CO1**

(a) $x_1(t) = e^{j10t}$

(b) $x_2(t) = e^{(-1+j)t}$

(c) $x_3[n] = e^{j7\pi n}$

(d) $x_4[n] = 3e^{j3\pi(n+1/2)/5}$

(e) $x_5[n] = 3e^{j3/5(n+1/2)}$