Final Exam

Discipline: BE Electrical   **Instructor: M. Junaid Arshad**

Course Title: Digital Signal Processing   **Semester: 6th Semester**

Batch: 12

Total Marks: 10   **Time Allowed: 40 Minutes**

Roll no. & Name: _____

Question no.1:

1. If x(n) is a discrete-time signal, then the value of x(n) at non integer value of 'n' is?
   a) Zero
   b) Positive
   c) Negative
   d) Not defined

2. The phase function of a discrete time signal $x(n)=a^n$, where $a=r.e^{j\theta}$ is?
   a) tan(nθ)
   b) nθ
   c) tan^{-1}(nθ)
   d) none of the mentioned

3. x(n)*δ(n-k)=?
   a) x(n)
   b) x(k)
   c) x(k)*δ(n-k)
   d) x(k)*δ(k)

4. The system described by the equation y(n)=ay(n-1)+b x(n) is a recursive system.
   a) True
   b) False

5. If x(n) is a discrete-time signal, then the value of x(n) at non integer value of 'n' is?
   a) Zero
   b) Positive
   c) Negative
   d) Not defined

6. The odd part of a signal x(t) is?
   a) x(t)+x(-t)
   b) x(t)-x(-t)
   c) (1/2)*(x(t)+x(-t))
   d) (1/2)*(x(t)-x(-t))

7. Zero-state response is also known as _____
   a) Free response
   b) Forced response

c) Natural response

d) None of the mentioned

8. The total solution of the difference equation is given as _____

a) $y_p(n)-y_h(n)$

b) $y_p(n)+y_h(n)$

c) $y_h(n)-y_p(n)$

d) None of the mentioned

9. Which of the following is done to convert a continuous time signal into discrete time signal?

a) Modulating

b) Sampling

c) Differentiating

d) Integrating

10. Let $x_1(t)$ and $x_2(t)$ be periodic signals with fundamental periods T1 and T2 respectively. Which of the following must be a rational number for $x(t)=x_1(t)+x_2(t)$ to be periodic?

a) T_1+T_2
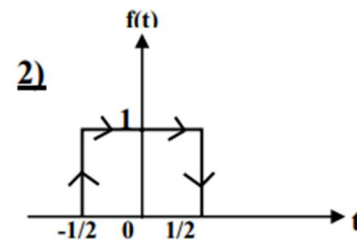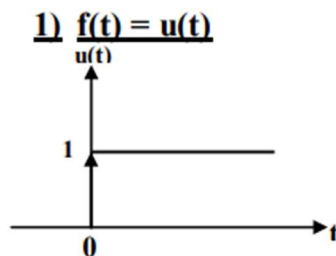
b) T_1-T_2

c) T_1/T_2

d) T_1*T_2

Question no.2:

Find the Fourier exponential for the signal as shown below:

$$f(t) = \begin{cases} A, -\dfrac{\pi}{2} < t < \dfrac{\pi}{2} \\ 0, \dfrac{\pi}{2} < t < \pi, -\pi < t < -\dfrac{\pi}{2} \end{cases}$$

Question no.3:

Find Fourier Transform (FT) of u(t) using differentiation property.

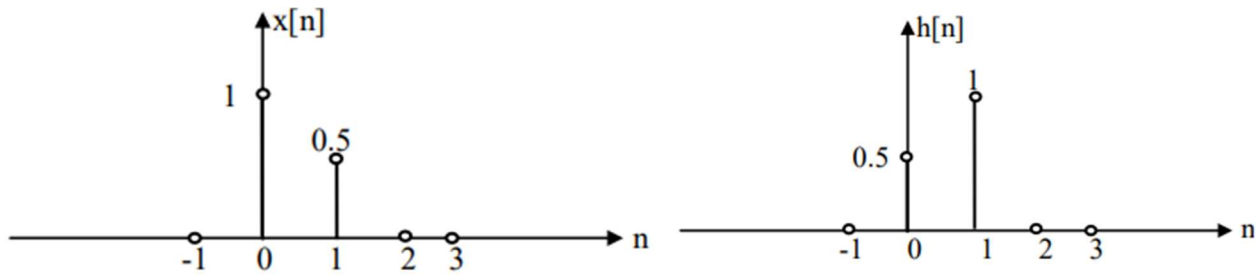1. $f(t) = u(t)$

1) f(t) = u(t)
u(t)

2)
f(t)

-1/2 0   1/2

Question no.4:

a) Determine the z-transform of the sequence given by:
$$y[n] = (n+1)\alpha^n u[n]$$
b) Perform the linear convolution with z-transform

Question no.5:

Find the linear convolution between

$$x[n] = 1,2,3,4 \; n \geq 0$$
$$h[n] = 4,3,2,1 \; n \geq 0$$