***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)=an, where a=r.ejθ 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) yp(n)-yh(n)  
   b) yp(n)+yh(n)  
   c) yh(n)-yp(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 x1(t) and x2(t) be periodic signals with fundamental periods T1 and T2 respectively. Which of the following must be a rational number for x(t)=x1(t)+x2(t) to be periodic?  
    a) T1+T2  
    b) T1-T2  
    c) T1/T2  
    d) T1\*T2

Question no.2: page no.24

Find the Fourier exponential for the signal as shown below:

Solution:

Fourier complex exponential

Where,

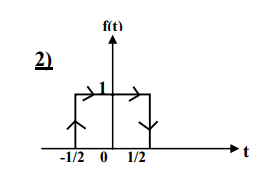
Re-arrange the coefficients

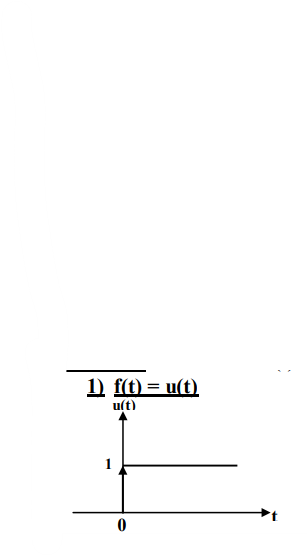
For sketch the spectrum of the signal above:

Using equation no.2

Question no.3: page no.28

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

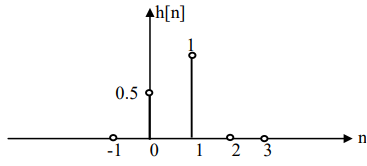


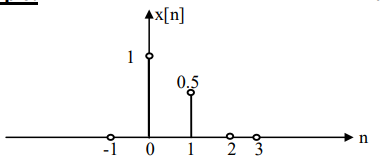


Question no.4: page no.43

1. Determine the z-transform of the sequence given by:

Solution:

1. Perform the linear convolution with z-transform



Solution:

Where,

Question no.5: page no.16

Find the linear convolution between

Solution: