Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

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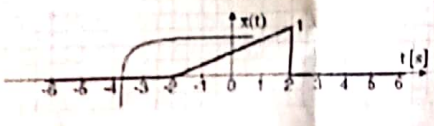
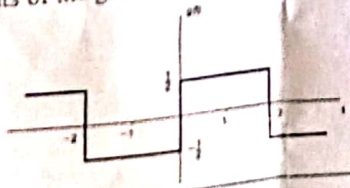
EE220 Signals and Systems

Spring 2021, Session 2019 (04th Semester)
Mid Term Exam

Time Allowed: 60 Minutes
Total Marks: 30

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.
- Return question paper with answer sheet

Q #	Part #	Question	Marks	CLO	PLO
Q.1	a)	**Define** the following terms: I. Invertible System II. Causal System III. System with Memory	06	CLO1, C1	PLO1
	b)	**Recall** signal transformation concepts and for the following signal, find $x(2t-1)$. 	04		
Q.2	a)	**Identify** the unit step response $s(t)$ of the system having impulse response $h(t)$. $h(t) = u(t)$.	05		
	b)	**Identify** the output y(t) of the system having impulse response $h(t)$ for the input $x(t)$ by applying convolution. $x(t) = e^{-at}u(t), \quad a > 0$ $h(t) = u(t)$.	05		
Q.3	a)	**Identify** the frequency components by computing Fourier series coefficient a_k for the given periodic signal. $x(t) = \begin{cases} 1, & \lvert t\rvert < T_1 \\ 0, & T_1 < \lvert t\rvert < T/2 \end{cases}$ 	06		
	b)	From Q.3(a), **define** the following periodic signal using time shifting and find the Fourier series coefficients of the given signal. 	04		

Good Luck ☺

$\approx 3.75 \times 10^{-4}$

University of Engineering and Technology
Lahore, Faisalabad Campus
Department Electrical, Electronics and Tele-communication Engineering

Subject: MA-346 Numerical Methods — Mid-term Exam (Spring Semester 2021)
Total Marks: 30 — Time allowed: 60 minutes

NOTE: All questions are compulsory.

CLO1

Q 1. Apply Newton-Raphson method to determine a root of the equation $\cos x = xe^x$ correct to three decimal places, using the initial approximation $x_0 = 1$. **(10)**

CLO3

Q 2. Find all the eigenvalues and the corresponding eigenvectors of the matrix $\begin{bmatrix} 3 & 2 & 1 \\ 2 & 3 & 2 \\ 1 & 2 & 3 \end{bmatrix}$ by Jacobi's method. Give results at the end of third rotation. **(8)**

CLO3

Q 3.

i. Find normal equations to determine the constants a, b and c to fit a parabola $y = ax^2 + bx + c$ by the method of least squares. **(6)**

ii. By the method of least squares, find a relation of the form $y = ax^b$, that fits the following data: **(6)**

x	1	2	3	4	5
y	0.5	2.0	4.5	8.0	12.5

Friday, July 09, 2021

2019-EE-383

University of Engineering & Technology	4th Semester (Session 2019)	Mid-Term
EE-232 Data Structures and Algorithms	Spring 2021 Time: 60 mins	Total Marks: 30

Attempt all Questions.

Q.1 CLO1 [20]

(a) See the below recursive function. Assume n=3. Dry run the code and explain why the function is not a good recursive function. [5]

```
int abc( unsigned int n )
{
  If (n==0)
    return 0;
  else
    return( abc (n/3 + 1) + n - 1 );
```

(b) Search the element '3' in the given array A={3,4,5,6,7,8,9,10,11} by using binary search algorithm. Show each step. [5]

(c) Calculate he running time of binary search algorithm. [5]

(d) Compute the big-Oh of the following code. [5]

```
int sum (int n)
  {
    int a, b;
    b=0;
    for(a=1; a<=n; a++)
        b+=a * a * a;
    return (b);
}
```

Q.2 CLO2 [10]

(a) Evaluate the following post fix expression by using stack. [5]

6 5 2 3 + 8 * + 5 + *

(b) Make an expression tree of the following expression. [5]

(1 + 2 * 3) + ((4 * 5 + 6) * 7)