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**SUB: COMMUNICATION LABORATORY**

**ASSIGNMENT-1**

**MATLAB Problem**

1. **Sin Function**
2. **Step function**
3. **Ramp function**
4. **Exponential (growing and decaying)**
5. **Impulse function Solution:**

**Code:**

clc; clear; close all;

%% Time definitions

t = -5:0.01:5; % Continuous time n = -5:1:5; % Discrete time

%%

**1.SINE FUNCTION**

f = 1; % Frequency (Hz) sin\_t = sin(2\*pi\*f\*t); sin\_n = sin(2\*pi\*f\*n);

figure; subplot(2,1,1);

plot(t, sin\_t, 'b', 'LineWidth', 1.5);

title('Continuous Sine Function'); xlabel('t'); ylabel('sin(2\pi f t)'); grid on;

subplot(2,1,2);

stem(n, sin\_n, 'r', 'filled');

title('Discrete Sine Function'); xlabel('n'); ylabel('sin(2\pi f n)'); grid on;

%%

**2.STEPFUNCTION:** step\_t = t >= 0; step\_n = n >= 0;

figure; subplot(2,1,1);

plot(t, step\_t, 'b', 'LineWidth', 1.5);

title('Continuous Step Function'); xlabel('t'); ylabel('u(t)'); grid on;

subplot(2,1,2);

stem(n, step\_n, 'r', 'filled');

title('Discrete Step Function'); xlabel('n'); ylabel('u[n]'); grid on;

%%

**3.RampFunction** ramp\_t = t .\* (t >= 0); ramp\_n = n .\* (n >= 0);

figure; subplot(2,1,1);

plot(t, ramp\_t, 'b', 'LineWidth', 1.5);

title('Continuous Ramp Function'); xlabel('t'); ylabel('t u(t)'); grid on;

subplot(2,1,2);

stem(n, ramp\_n, 'r', 'filled');

title('Discrete Ramp Function'); xlabel('n'); ylabel('n u[n]'); grid on;

%%

**4.Exponentional Function** exp\_grow\_t = exp(0.5\*t); exp\_decay\_t = exp(-0.5\*t); exp\_grow\_n = exp(0.5\*n); exp\_decay\_n = exp(-0.5\*n);

figure; subplot(2,2,1);

plot(t, exp\_grow\_t, 'b', 'LineWidth', 1.5);

title('Continuous Growing Exponential'); xlabel('t'); ylabel('e^{0.5t}'); grid on;

subplot(2,2,2);

plot(t, exp\_decay\_t, 'r', 'LineWidth', 1.5);

title('Continuous Decaying Exponential'); xlabel('t'); ylabel('e^{-0.5t}'); grid on;

subplot(2,2,3);

stem(n, exp\_grow\_n, 'b', 'filled');

title('Discrete Growing Exponential'); xlabel('n'); ylabel('e^{0.5n}'); grid on;

subplot(2,2,4);

stem(n, exp\_decay\_n, 'r', 'filled');

title('Discrete Decaying Exponential'); xlabel('n'); ylabel('e^{-0.5n}'); grid on;

%%

**5.Impulse Function** impulse\_t = (t == 0); impulse\_n = (n == 0);

figure; subplot(2,1,1);

plot(t, impulse\_t, 'b', 'LineWidth', 1.5);

title('Continuous Impulse Function (Ideal)'); xlabel('t'); ylabel('\delta(t)'); grid on;

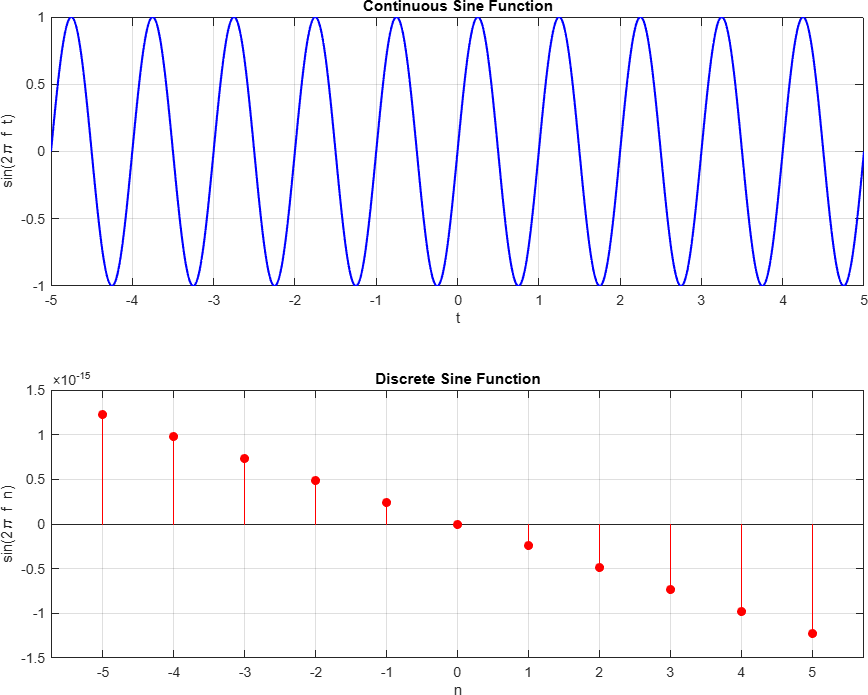
subplot(2,1,2);

stem(n, impulse\_n, 'r', 'filled');

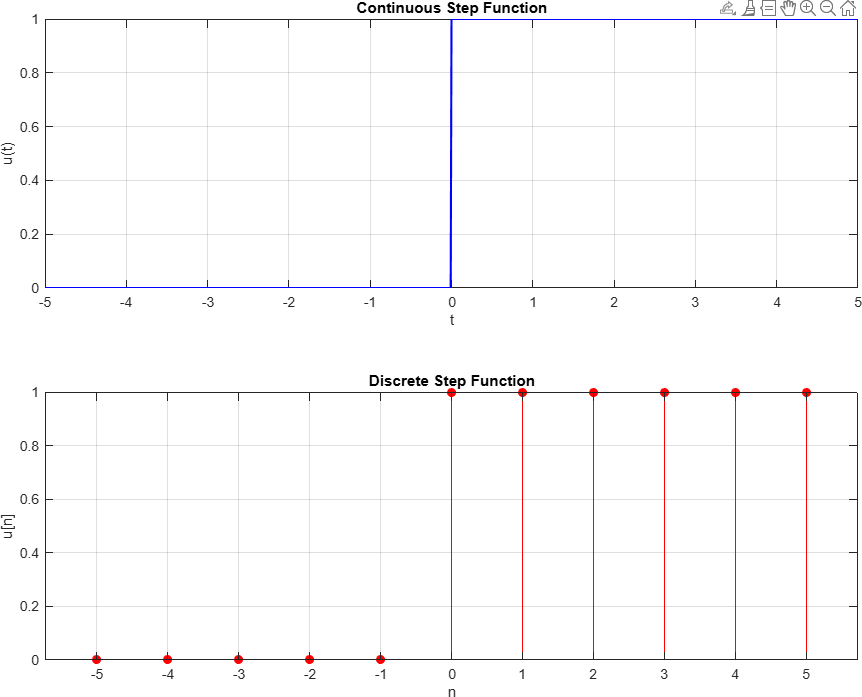
title('Discrete Impulse Function'); xlabel('n'); ylabel('\delta[n]'); grid on;

Graph

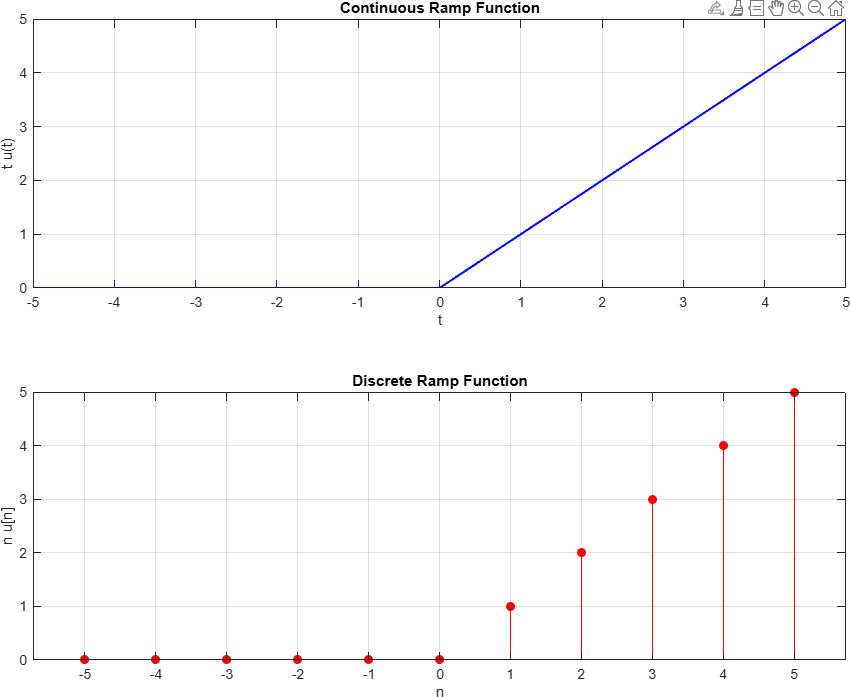
Sin Function



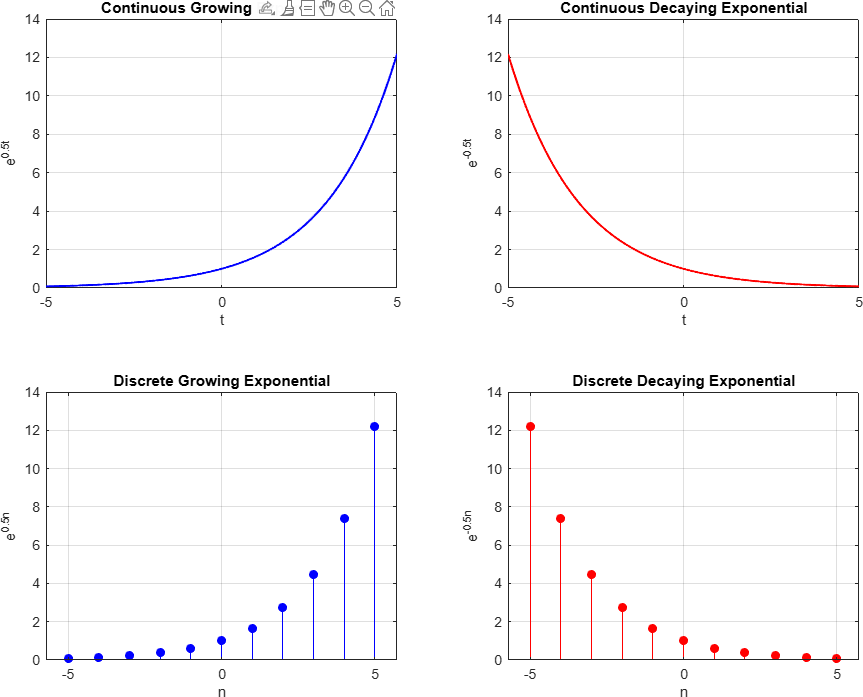
Step Function



Ramp Function



Exponential



Impulse Function

