

American International University-Bangladesh

Course name: Data Communication

Course code: COE 3201

Section: H

Semester: Spring 2023-24

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Experiment no:01

Experiment name: Introduction to MATLAB

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| Write the code in MATLAB. | Output of the code/Figure: |
| Problem A&B  % ID = 22-47035-1 AB = 22, GH = 51, CDEF = 4703, DG = 75  t = linspace(-5, 6,82); % 82 samples  CDEF = 4703;  A1 = 22; %AB  phase\_degree1 = 75; %j1  phase\_rad1 = deg2rad(phase\_degree1); %j1  x1 = A1\*sin(2\*pi\*CDEF\*t + phase\_rad1);  figure;  plot(t, x1)  xlabel('t')  ylabel('X1')  title('sin function')  grid on;  % ID = 22-47035-1 , AB = 22, GH = 51, CDEF = 4703  A2 = 51; %GH  phase\_degree2 = 30;% j2  phase\_rad2 = deg2rad(phase\_degree2); %j2  x2 = A2\*cos(2\*pi\*CDEF\*t + phase\_rad2); % phase\_rad2 = j2  figure;  plot(t, x2)  xlabel('t')  ylabel('X2')  title('cosine function')  grid on  Problem: C |  |
| % ID = 22-47035-1 AB = 22, GH = 51, CDEF = 4703, DG = 75  t = linspace(-5, 6,80); % 80 samples  CDEF = 4703;  A1 = 22; %AB  phase\_degree1 = 75; %j1  phase\_rad1 = deg2rad(phase\_degree1); %j1  x1 = A1\*sin(2\*pi\*CDEF\*t + phase\_rad1);  figure;  plot(t, abs(x1))  title('Amplitude of x1')  grid on;  figure;  plot(t, angle(x1))  title('Angle of x1')  grid on  % ID = 22-47035-1 , AB = 22, GH = 51, CDEF = 4703  A2 = 51; %GH  phase\_degree2 = 30;% j2  phase\_rad2 = deg2rad(phase\_degree2); %j2  x2 = A2\*cos(2\*pi\*CDEF\*t + phase\_rad2); % phase\_rad2 = j2  figure;  plot(t, abs(x2))  title('Amplitude of x2')  grid on  figure;  plot(t, angle(x2))  title('Angle of x2')  grid on  % Phase verification  x1\_phase\_at\_0\_deg = phase\_degree1; % Phase of x1 at t = 0 in degrees  x2\_phase\_at\_0\_deg = phase\_degree2; % Phase of x2 at t = 0 in degrees  disp(['Phase of x1(t) at t = 0: ', num2str(x1\_phase\_at\_0\_deg), ' degrees']);  disp(['Phase of x2(t) at t = 0: ', num2str(x2\_phase\_at\_0\_deg), ' degrees']);  % Maximum amplitude verification  x1\_max\_amplitude = max(abs(x1)); % Maximum amplitude of x1  x2\_max\_amplitude = max(abs(x2)); % Maximum amplitude of x2  disp(['Maximum amplitude of x1(t): ', num2str(x1\_max\_amplitude)]);  disp(['Maximum amplitude of x2(t): ', num2str(x2\_max\_amplitude)]); |  |
| Problem D:  % ID = 22-47035-1 AB = 22, GH = 51, CDEF = 4703, DG = 75  t = linspace(-5, 5,80); % 80 samples  CDEF = 4705;  A1 = 22; %AB  phase\_degree1 = 75; %j1  phase\_rad1 = deg2rad(phase\_degree1); %j1  x1 = A1\*sin(2\*pi\*CDEF\*t + phase\_rad1);  subplot(3, 1, 1)  plot(t, x1)  xlabel('t')  ylabel('X1')  title('sin function')  grid on;  % ID = 22-47035-1 , AB = 22, GH = 51, CDEF = 4703  A2 = 51; %GH  phase\_degree2 = 30;% j2  phase\_rad2 = deg2rad(phase\_degree2); %j2  x2 = A2\*cos(2\*pi\*CDEF\*t + phase\_rad2); % Here phase\_rad2 = j2  subplot(3, 1, 2)  plot(t, x2)  xlabel('t')  ylabel('X2')  title('cosine function')  grid on  Problem:E |  |
| % ID = 22-47035-1 AB = 22, GH = 51, CDEF = 4703, DG = 75  t = linspace(-5, 6,82); % 82 samples  CDEF = 4703;  A1 = 22; %AB  phase\_degree1 = 75; %j1  phase\_rad1 = deg2rad(phase\_degree1); %j1  x1 = A1\*sin(2\*pi\*CDEF\*t + phase\_rad1);  subplot(3, 1, 1)  plot(t, x1, 'r')  xlabel('t')  ylabel('X1')  title('Sin function')  grid on;  % ID = 22-47035-1 , AB = 22, GH = 51, CDEF = 4703  A2 = 51; %GH  phase\_degree2 = 30;% j2  phase\_rad2 = deg2rad(phase\_degree2); %j2  x2 = A2\*cos(2\*pi\*CDEF\*t + phase\_rad2); % phase\_rad2 = j2  subplot(3, 1, 2)  plot(t, x2)  xlabel('t')  ylabel('X2')  title('cosine function')  grid on  x3 = x1 + x2;  subplot(3, 1, 3);  plot(t, x3, 'k');  xlabel('t')  ylabel('x3')  title('X3 = x1 + x2')  grid on    Problem F |  |
| % ID = 22-47035-1 AB = 22, GH = 51, CDEF = 4703, DG = 75  t = linspace(-5, 6,82); % 82 samples  CDEF = 4703;  A1 = 22; %AB  phase\_degree1 = 75; %j1  phase\_rad1 = deg2rad(phase\_degree1); %j1  x1 = A1\*sin(2\*pi\*CDEF\*t + phase\_rad1);  % ID = 22-47035-1 , AB = 22, GH = 51, CDEF = 4703  A2 = 51; %GH  phase\_degree2 = 30;% j2  phase\_rad2 = deg2rad(phase\_degree2); %j2  x2 = A2\*cos(2\*pi\*CDEF\*t + phase\_rad2); % phase\_rad2 = j2  x3 = x1 + x2;  figure;  plot(t, abs(x3), 'k');  xlabel('t')  ylabel('x3')  title('x3 = x1 + x2')  grid on  figure;  plot(t, angle(x3), 'k');  xlabel('t')  ylabel('x3')  title('x3 = x1 + x2')  grid on |  |
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