%quesiton 1

disp('question 1');

d = 5;

t = 0:1:10;

f = heaviside(t-d);

plot(t,f);

xlabel("time");

ylabel("heavyside (t)");

axis([0 10 -.2 1.2]);

title("heavyside function - problem 1");

disp('Press any key to continue...');

pause;



%questino 2

disp('question 2');

t2=0:0.01:10;

f2 = heaviside(t2-d);

plot(t2,f2);

xlabel("time");

ylabel("heavyside (t2)");

axis([0 10 -.2 1.2]);

title("heavyside function - problem 2");

disp('Press any key to continue...');

pause;



%question 3

disp('question 3');

A = 1;

alpha = 0.8;

k = 0:1:100;

T = 0.1;

n = k\*T;

stem(n,A\*power(alpha,n));

title("exponential sequence - problem 3");

disp('Press any key to continue...');

pause;



%question 4

disp('question 4');

alpha = 1.6;

stem(n,A\*power(alpha,n));

title("exponential sequence - problem 4");

disp('Press any key to continue...');

pause;



%question 5

disp('question 5');

A = 1;

alpha = 1.0;

k = 0:1:50;

T = 0.1;

n = k\*T;

stem(n,A\*power(alpha,n));

title("exponential sequence - problem 5");

disp('Press any key to continue...');

pause;



%question 6

disp('question 6');

T=1;

k=0:1:25;

n=k\*T;

n2=cos((pi\*n)/4);

plot(n,n2);

title("sinusoid function - problem 6");

disp('Press any key to continue...');

pause;



%question 7

disp('question 7');

T=1;

k=0:1:25;

n=k\*T;

n3=cos((pi\*(n+8))/4);

plot(n,n3);

title("sinusoid function - problem 7");

disp('Press any key to continue...');

pause;



%question 8

disp('question 8');

%part 1

n4 = cos((3\*pi\*n)/8);

plot(n,n4);

%part 2

n5 = cos((3\*pi\*(n+16))/8);

plot(n,n5);

title("sinusoid function - problem 8");

disp('Press any key to continue...');

pause;



%question 9

disp('question 9');

disp('number 8 has a higher frequence shown by the graphs');

disp('due to the 3pi vs pi');

disp('Press any key to continue...');

pause;

%question 10

disp('question 10');

disp('porblem 7 sinusoid = n2/n3');

disp('problem 8 sinusoid = n4/n5');

disp('problem 8 takes more samples within a specified time');

disp('to appear periodic due to the higher frequency of the function');

disp('Press any key to continue...');

pause;

disp('done');