QUIZ7

1. We have given the following MATLAB code to evaluate the Lagrange polynomial,

```
function[C,L]=lagran(X,Y)
%Input - X is a vector that contains a list of abscissas
%      - Y is a vector that contains a list of ordinates

w=length(X);
n=w-1;
L=zeros(w,w);
for k=1:n+1
  V=1;
  for j=1:n+1
    if k~=j
      V=conv(V,poly(X(j)))/(X(k)-X(j));
    end
  end
  L(k,:)=V;
end
C=Y*L;
```

where

The *poly* command creates a vector whose entries are the coefficients of a polynomial with specified roots.

```
>>P=poly(2)
>>1 -2
>>Q=poly(3)
>>1 -3
```

The *conv* command produces a vector whose entries are the coefficients of a polynomial that is the product of two other polynomials.

```
>>conv(P,Q)
>>1 -5 6 %Thus the product of P(x) and Q(x) is x^2-5x+6
```

And

```
>> X=[1 2 3 5]
>> Y=[1.06 1.12 1.34 1.78]
>> [C,L]=lagran(X,Y)
C =   -0.0200   0.2000  -0.4000   1.2800
L =
   -0.1250   1.2500  -3.8750   3.7500
    0.3333  -3.0000   7.6667  -5.0000
   -0.2500   2.0000  -4.2500   2.5000
    0.0417  -0.2500   0.4583  -0.2500
```

Describe the meaning of the vector **C**.