The Answer Of Exam F

1)

a)

```
>>syms x y
>>simplify((x^10-y^10)/(x-y))

ans =

x^9+y*x^8+y^2*x^7+y^3*x^6+y^4*x^5+y^5*x^4+y^6*x^3+y^7*x^2+y^8*x+y^9
```

b)

```
>>A=[1 -3 9;15 -5 23;-1 -11 -65];
>>B=[1 2 -6;-2 -3 -9; -1 -7 10];
```

i.

```
>>A*A'
ans =
        91         237        -553
       237         779       -1455
```

```
      -553      -1455       4347
>>A*B'
ans =
  -59   -74   110
 -133  -222   250
  367   620  -572
>>A+B'
ans =
    2    -5     8
   17    -8    16
   -7   -20   -55
```

ii.

```
>>asin(5*A)
ans =
   1.5708 - 2.2924i   -1.5708 + 3.4001i    1.5708 - 4.4997i
   1.5708 - 5.0106i   -1.5708 + 3.9116i    1.5708 - 5.4381i
  -1.5708 + 2.2924i   -1.5708 + 4.7004i   -1.5708 + 6.4770i
>>log(abs(inv(A)))
```

ans =

-1.8853 -2.5613 -5.0668

-1.3863 -4.2195 -3.5264

-3.1091 -5.6058 -4.5560

2)

```
%Lagrange Interpolation method
function Pn= IntL(x,y,c,n)
for i=1:n+1
    L(i)=1;
    for j=1:n+1
        if i~=j
            L(i) =L(i) *(c-x(j))/(x(i)-x(j));
        end
    end
end
Pn=0;
for i=1:n+1
    Pn=Pn+y(i)*L(i);
end
disp('the lagrange interpolation polynomial')
disp(Pn)
```

>>Pn= IntL([0 0.2 0.4 0.6 0.8],[1 1.22140 1.49182 1.82212 2.22554],0.3,4)

the lagrange interpolation polynomial

1.3499

Pn =

1.3499

3)

a)

```
%Euler method
function y=Euler(x0,y0,xn,h)
x(1)=x0;
y(1)=y0;
n=(xn-x0)/h;
for i=1:n
    y(i+1)=y(i)+h*f(x(i),y(i));
    x(i+1)=x(i)+h;
end
function d=f(x,y)
d=x+y;
```

>>y=Euler(0,1,0.2,0.1)

y =

1.0000 1.1000 1.2200

>>y(3)

ans =

1.2200

b)

```
>>dsolve('Dy = x+y', 'y(0) = 1','x')

ans =

-1-x+2*exp(x)



>>exact=-1-0.2+2*exp(0.2)
exact =
    1.2428
c)
>>e=abs(exact-y(3))
e =
    0.0228
```