زهرا ایرانپور مبارکه
۹۸۱۹۸۹۳

سوال اول: قسمت الف)

```
V = [1.05; 1; 1; 1.04];
delta = zeros(4,1);

YBUS = [ 23-j*46  -5+j*10    -8+j*16   -10+j*20
       -5+j*10  30-j*60    -10+j*30  -15+j*20
       -8+j*16  -10+j*30   23-j*61   -5+j*15
       -10+j*20 -15+j*20   -5+j*15   30-j*55];

SY= abs(YBUS);
YT = angle(YBUS);
Ps=[-6; -5; 1];
Qs=[-3; -2];

%%%yekbar tekrar

P=[V(2)*V(1)*SY(2,1)*cos(YT(2,1)-delta(2)+delta(1))+V(2)^2*SY(2,2)*cos(YT(2,2))+ ...
   V(2)*V(3)*SY(2,3)*cos(YT(2,3)-delta(2)+delta(3))+V(2)*V(4)*SY(2,4)*cos(YT(2,4)-
delta(2)+delta(4));
   V(3)*V(1)*SY(3,1)*cos(YT(3,1)-delta(3)+delta(1))+V(3)^2*SY(3,3)*cos(YT(3,3))+ ...
   V(3)*V(2)*SY(3,2)*cos(YT(3,2)-delta(3)+delta(2))+V(3)*V(4)*SY(3,4)*cos(YT(3,4)-
delta(3)+delta(4));
   V(4)*V(1)*SY(4,1)*cos(YT(4,1)-delta(4)+delta(1))+V(4)^2*SY(4,4)*cos(YT(4,4))+ ...
   V(4)*V(2)*SY(4,2)*cos(YT(4,2)-delta(4)+delta(2))+V(4)*V(3)*SY(4,3)*cos(YT(4,3)-
delta(4)+delta(3))];

Q= [-V(2)*V(1)*SY(2,1)*sin(YT(2,1)-delta(2)+delta(1))-V(2)^2*SY(2,2)*sin(YT(2,2))-
...
    V(2)*V(3)*SY(2,3)*sin(YT(2,3)-delta(2)+delta(3))-V(2)*V(4)*SY(2,4)*sin(YT(2,4)-
delta(2)+delta(4));
   -V(3)*V(1)*SY(3,1)*sin(YT(3,1)-delta(3)+delta(1))-V(3)^2*SY(3,3)*sin(YT(3,3))- ...
    V(3)*V(2)*SY(3,2)*sin(YT(3,2)-delta(3)+delta(2))-V(3)*V(4)*SY(3,4)*sin(YT(3,4)-
delta(3)+delta(4))];

%%%J
J(1,1)=V(2)*V(1)*SY(2,1)*sin(YT(2,1)-delta(2)+delta(1))+...
       V(2)*V(3)*SY(2,3)*sin(YT(2,3)-
delta(2)+delta(3))+V(2)*V(4)*SY(2,4)*sin(YT(2,4)-delta(2)+delta(4));
J(1,2)=-V(2)*V(3)*SY(2,3)*sin(YT(2,3)-delta(2)+delta(3));
J(1,2)
J(1,3)=-V(2)*V(4)*SY(2,4)*sin(YT(2,4)-delta(2)+delta(4));
J(1,4)=V(1)*SY(2,1)*cos(YT(2,1)-delta(2)+delta(1))+ ...
       V(3)*SY(2,3)*cos(YT(2,3)-delta(2)+delta(3))+V(4)*SY(2,4)*cos(YT(2,4)-
delta(2)+delta(4))+ ...
       V(2)*SY(2,2)*2*cos(YT(2,2));
J(1,5)=V(2)*SY(2,3)*cos(YT(2,3)-delta(2)+delta(3));
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```
J(2,1)=-V(3)*V(2)*SY(3,2)*sin(YT(3,2)-delta(3)+delta(2));
J(2,2)=V(3)*V(1)*SY(3,1)*sin(YT(3,1)-delta(3)+delta(1))+...
       V(3)*V(2)*SY(3,2)*sin(YT(3,2)-
delta(3)+delta(2))+V(3)*V(4)*SY(3,4)*sin(YT(3,4)-delta(3)+delta(4));
J(2,3)=-V(3)*V(4)*SY(3,4)*sin(YT(3,4)-delta(3)+delta(4));
J(2,4)= V(3)*SY(3,2)*cos(YT(3,2)-delta(3)+delta(2));
J(2,5)=V(1)*SY(3,1)*cos(YT(3,1)-delta(3)+delta(1))+ ...
       V(2)*SY(3,2)*cos(YT(3,2)-delta(3)+delta(2))+V(4)*SY(3,4)*cos(YT(3,4)-
delta(3)+delta(4))+...
       V(3)*2*SY(3,3)*cos(YT(3,3));

J(3,1)=-V(4)*V(2)*SY(4,2)*sin(YT(4,2)-delta(4)+delta(2));
J(3,2)=-V(4)*V(3)*SY(4,3)*sin(YT(4,3)-delta(4)+delta(3));
J(3,3)=V(4)*V(1)*SY(4,1)*sin(YT(4,1)-delta(4)+delta(1))
+V(4)*V(2)*SY(3,2)*sin(YT(4,2)-delta(4)+delta(2))+V(4)*V(3)*SY(4,3)*sin(YT(4,3)-
delta(4)+delta(3));
J(3,4)=V(4)*SY(4,2)*cos(YT(4,2)-delta(4)+delta(2));
J(3,5)=V(3)*SY(4,3)*cos(YT(4,3)-delta(4)+delta(3));

J(4,1)=V(2)*V(1)*SY(2,1)*cos(YT(2,1)-
delta(2)+delta(1))+V(2)*V(3)*SY(2,3)*cos(YT(2,3)-
delta(2)+delta(3))+V(2)*V(4)*SY(2,4)*cos(YT(2,4)-delta(2)+delta(4));
J(4,2)=-V(2)*V(3)*SY(2,3)*cos(YT(2,3)-delta(2)+delta(3));
J(4,3)=-V(2)*V(4)*SY(2,4)*cos(YT(2,4)-delta(2)+delta(4));
J(4,4)=-V(1)*SY(2,1)*sin(YT(2,1)-delta(2)+delta(1))-V(3)*SY(2,3)*sin(YT(2,3)-
delta(2)+delta(3))-V(4)*SY(2,4)*sin(YT(2,4)-delta(2)+delta(4))-
V(2)*2*SY(2,2)*sin(YT(2,2));
J(4,5)=-V(2)*SY(2,3)*sin(YT(2,3)-delta(2)+delta(3));

J(5,1)=-V(2)*V(3)*SY(2,3)*cos(YT(2,3)-delta(3)+delta(2));
J(5,2)=V(3)*V(1)*SY(3,1)*cos(YT(3,1)-delta(3)+delta(1))
+V(3)*V(2)*SY(3,2)*cos(YT(3,2)-delta(3)+delta(2))+V(3)*V(4)*SY(3,4)*cos(YT(3,4)-
delta(3)+delta(4));
J(5,3)=-V(3)*V(4)*SY(3,4)*cos(YT(3,4)-delta(3)+delta(4));
J(5,4)=-V(3)*SY(3,2)*sin(YT(3,2)-delta(3)+delta(2));
J(5,5)=-V(1)*SY(3,1)*sin(YT(3,1)-delta(3)+delta(1))- ...
       V(2)*SY(3,2)*sin(YT(3,2)-delta(3)+delta(2))-V(4)*SY(3,4)*sin(YT(3,4)-
delta(3)+delta(4))-...
       V(3)*2*SY(3,3)*sin(YT(3,3));


DP = Ps - P;
DQ = Qs - Q;
DC = [DP; DQ]
DX = J\DC;

delta(2)=delta(2)+DX(1);
delta(3)=delta(3) +DX(2);
delta(4)=delta(4) +DX(3);

V(2)= V(2)+DX(4);
V(3)= V(3)+DX(5);

V
delta
```

سوال اول: قسمت الف) خروجی

```
Command Window
ans =

   -30


DC =

   -5.1500
   -4.4000
    0.2720
   -1.7000
   -0.6000


V =

    1.0500
    0.8956
    0.9101
    1.0400


delta =

         0
   -0.1766
   -0.1719
   -0.1280
```

سوال اول: قسمت ب)

```
V = [1.05; 1; 1; 1.04];
delta = zeros(4,1);

YBUS = [ 23-j*46  -5+j*10    -8+j*16   -10+j*20
       -5+j*10  30-j*60    -10+j*30  -15+j*20
       -8+j*16  -10+j*30   23-j*61   -5+j*15
       -10+j*20 -15+j*20   -5+j*15   30-j*55];

SY= abs(YBUS);
YT = angle(YBUS);
Ps=[-6; -5; 1];
Qs=[-3; -2];

%%%yekbar tekrar


P=[V(2)*V(1)*SY(2,1)*cos(YT(2,1)-delta(2)+delta(1))+V(2)^2*SY(2,2)*cos(YT(2,2))+ ...
   V(2)*V(3)*SY(2,3)*cos(YT(2,3)-delta(2)+delta(3))+V(2)*V(4)*SY(2,4)*cos(YT(2,4)-
delta(2)+delta(4));
   V(3)*V(1)*SY(3,1)*cos(YT(3,1)-delta(3)+delta(1))+V(3)^2*SY(3,3)*cos(YT(3,3))+ ...
   V(3)*V(2)*SY(3,2)*cos(YT(3,2)-delta(3)+delta(2))+V(3)*V(4)*SY(3,4)*cos(YT(3,4)-
delta(3)+delta(4));
   V(4)*V(1)*SY(4,1)*cos(YT(4,1)-delta(4)+delta(1))+V(4)^2*SY(4,4)*cos(YT(4,4))+ ...
   V(4)*V(2)*SY(4,2)*cos(YT(4,2)-delta(4)+delta(2))+V(4)*V(3)*SY(4,3)*cos(YT(4,3)-
delta(4)+delta(3))];

Q= [-V(2)*V(1)*SY(2,1)*sin(YT(2,1)-delta(2)+delta(1))-V(2)^2*SY(2,2)*sin(YT(2,2))-
...
    V(2)*V(3)*SY(2,3)*sin(YT(2,3)-delta(2)+delta(3))-V(2)*V(4)*SY(2,4)*sin(YT(2,4)-
delta(2)+delta(4));
   -V(3)*V(1)*SY(3,1)*sin(YT(3,1)-delta(3)+delta(1))-V(3)^2*SY(3,3)*sin(YT(3,3))- ...
    V(3)*V(2)*SY(3,2)*sin(YT(3,2)-delta(3)+delta(2))-V(3)*V(4)*SY(3,4)*sin(YT(3,4)-
delta(3)+delta(4))];

b= [ -46  +10    +16   +20
      +10  -60    +30  +20
      +16  +30    -61   +15
      +20  +20    +15   -55];
b1=b;

b1(1,:)=[];
b1(:,1)=[];
b2=b1
B1T = inv(b2)

b2(3,:)=[];
b2(:,3)=[];
B2=b2
B2T = inv(B2)

DeltaP = Psch - P
DeltaQ = Qsch - Q;
```

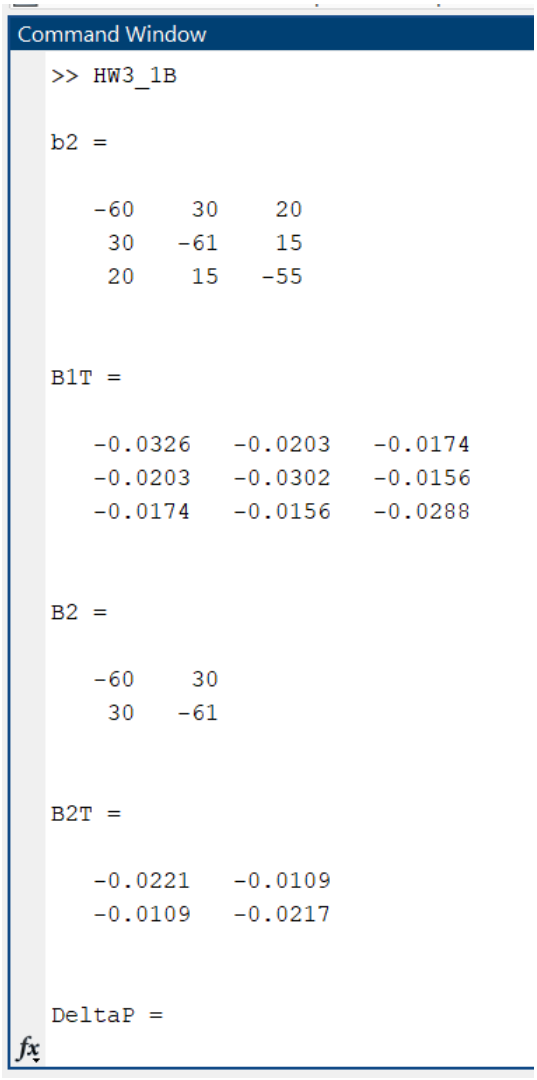
```
Ddelta=-B1T*(DeltaP/V)


DV=-B2T*(DeltaQ/V);

delta(2)=delta(2)+Ddelta(1);
delta(3)=delta(3)+Ddelta(2);
delta(4)=delta(4)+Ddelta(3);
V(2)=V(2)+DV(1);
V(3)=V(3)+DV(2);


V
delta
```

سوال اول: قسمت ب) خروجی



```
Command Window
>> HW3_1B

b2 =

   -60    30    20
    30   -61    15
    20    15   -55


B1T =

   -0.0326   -0.0203   -0.0174
   -0.0203   -0.0302   -0.0156
   -0.0174   -0.0156   -0.0288

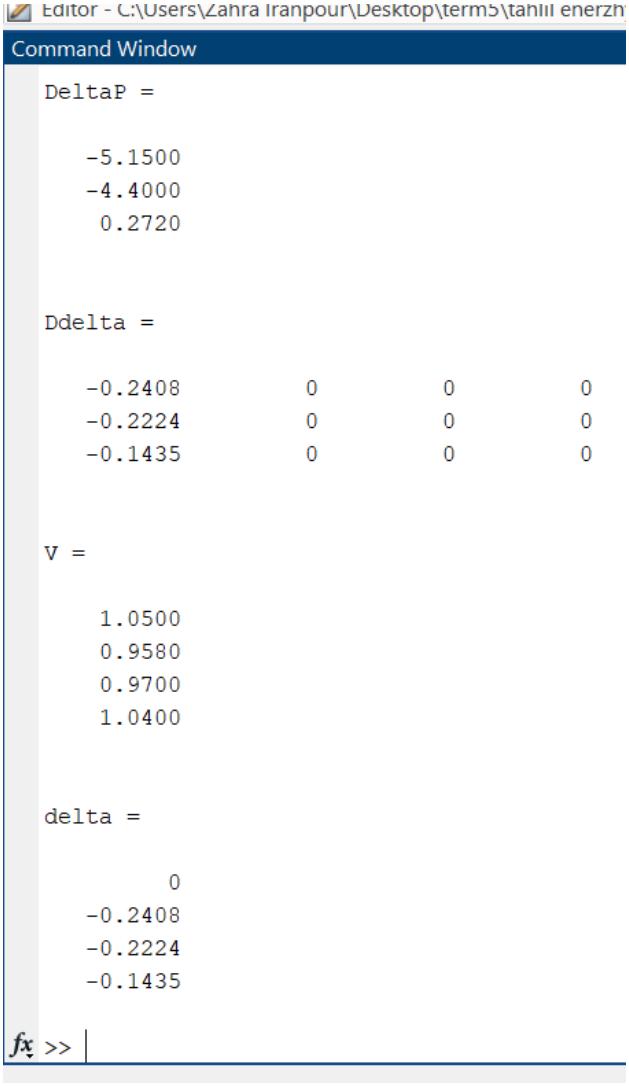

B2 =

   -60    30
    30   -61


B2T =

   -0.0221   -0.0109
   -0.0109   -0.0217


DeltaP =
```



```
Editor - C:\Users\Zahra Iranpour\Desktop\term5\tahlil enerzh
Command Window
DeltaP =

   -5.1500
   -4.4000
    0.2720


Ddelta =

   -0.2408         0         0         0
   -0.2224         0         0         0
   -0.1435         0         0         0


V =

    1.0500
    0.9580
    0.9700
    1.0400


delta =

         0
   -0.2408
   -0.2224
   -0.1435

>>
```