**EASTERN MEDITERRANEAN UNIVERSITY**



**Department of Industrial Engineering**

**IENG511 Optimization Theory**

**HOMEWORK 6 Spring 2017-18**

1. Consider the following linear programming problem and its final simplex table

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | *z* | *x1* | *x2* | *x3* | *x4* | *x5* | *RHS* | | *z* | *1* | *0* | *0* | *?* | *1* |  |  | | *x2* | *0* | *0* | *1* | *?* |  |  |  | | *x1* | *0* | *1* | *0* | *?* |  |  |  | |

1. Fill the empty places?
2. For which value of *d* the current BFS is optimal solution?
3. Find the optimal solution of dual problem?
4. Find the maximum of  by each of the following methods where *l=0.2* and *[a1,b1]=[0,1].*
5. Dichotomus Method.
6. Golden Section Method.
7. Consider the function, the following table contains the summery of Golden Section Method for starting from ***x****0=(0,0)* in direction ***d****=(1,1)*, for Minimizing , where *l=0.2*. Fill the null spaces. (15 points)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *K* | *ak* | *bk* |  |  |  |  |
| *1* | *-1* | *2* | *0.146* | *0.854* | *?* | *1.155025* |
| *2* | *-1* | *0.854* | *-0.29177* | *?* | *1.4239248* | *0.8854737* |
| *3* | *?* | *0.854* | *0.146* | *0.4163* | *0.8854737* | *0.8328* |
| *4* | *0.146* | *?* | *0.4163* | *?* | *?* | *?* |
| *5* | *?* | *0.58231* | *?* | *0.4163* | *0.79925* | *0.8328* |
| *6* | *0.146* | *?* | *0.24925* | *0.31267* | *0.84151* | *?* |
| *7* | *?* | *0.4163* |  | | | |

1. Consider the function , given a point ***x****0=(x1,x2)*and a non zero direction ***d****=(d1,d2)*, let .
2. Obtain the expilicit expression for .
3. For ***x****0=(4,0)*and ***d****=(-1,1)* use the Finonacci Method for Minimize where *l=0.2*.
4. If the optimal solution of part (b) is  start from and find Mimimize along ***d****=(1,1)*.*(Hint: Use the first drivative of objective function.)*