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**16/ENG06/006**  
**MECHANICAL**  
**ENG 382 ASSIGNMENT**

**ASSIGNMENT 3**

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 16/ENG06/006  
 Mechanical  
 Eng 382 Assignment

Assignment 3.

Solution

$$\begin{aligned} T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 &= 4 \\ 2T_1 + T_2 + T_3 + 2T_4 + T_5 - 3T_6 &= 20 \\ T_1 + 3T_2 - 3T_3 - T_4 + 2T_5 + T_6 &= -15 \\ 5T_1 + 2T_2 - T_3 - T_4 + 2T_5 + T_6 &= -3 \\ 3T_1 - T_2 + 2T_3 + 3T_4 + T_5 + 3T_6 &= 16 \\ 4T_1 + 3T_2 + T_3 - 6T_4 - 3T_5 - 2T_6 &= -27 \end{aligned}$$

Using forward elimination

~~multiply equation (1) by~~

$$a_{21} - \left( \frac{a_{21}}{a_{11}} (a_{11}) \right) + a_{22} - \left( \frac{a_{22}}{a_{11}} (a_{12}) \right) + a_{23} - \left( \frac{a_{23}}{a_{11}} (a_{13}) \right) + a_{24} - \left( \frac{a_{24}}{a_{11}} (a_{14}) \right) +$$

$$a_{25} - \left( \frac{a_{25}}{a_{11}} (a_{15}) \right) + a_{26} - \left( \frac{a_{26}}{a_{11}} (a_{16}) \right) = b_2 - \left( \frac{a_{21}}{a_{11}} (b_1) \right)$$

$$2 - \left( \frac{2}{1} \times 1 \right) T_1 + \left( -1 - \left( \frac{2}{1} \times 1 \right) \right) T_2 + 1 - \left( \frac{2}{1} \times -2 \right) T_3 + 2 - \left( \frac{2}{1} \times 1 \right) T_4 +$$

$$1 - \left( \frac{2}{1} \times 3 \right) T_5 - 3 - \left( \frac{2}{1} \times -1 \right) T_6 = 20 - \left( \frac{2}{1} \times 4 \right)$$

$$0T_1 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$$

$$a_{31} - \frac{a_{31}}{a_{11}} (a_{11}) + a_{32} - \frac{a_{32}}{a_{11}} (a_{12}) + a_{33} - \frac{a_{33}}{a_{11}} (a_{13}) + a_{34} - \frac{a_{34}}{a_{11}} (a_{14}) +$$

$$= b_3 - \left( \frac{a_{31}}{a_{11}} (b_1) \right)$$

$$1 - 1(T_1) + 3 - 1(T_2) + (-3 - 1(-2T_3)) + (-1 - 1(T_4)) + (2 - 1(-3T_5)) +$$

$$(1 - 1(-1))T_6 = -15 - 1(4)$$

$$0T_1 + 2T_2 - T_3 - 2T_4 - T_5 + 2T_6 = -19$$

$$a_{41} - \frac{a_{41}}{a_{11}} (a_{11}), a_{42} - \frac{a_{41}}{a_{11}} (a_{12}), a_{43} - \frac{a_{41}}{a_{11}} (a_{13}), a_{44} - \frac{a_{41}}{a_{11}} (a_{14}), \dots =$$

$$b_4 - \frac{a_{41}}{a_{11}} (b_1)$$

$$5T_1 - 5T_1 + 2 - 5(1)T_2 + (-1 - 5(-2))T_3 + (-1 - 5(1))T_4 + (2 - 5(3))T_5 + 1 - 5(-1)T_6 = -3 - 5(4)$$

$$0T_1 - 3T_2 + 9T_3 - 6T_4 - 13T_5 + 6T_6 = -23$$

$$a_{51} - \frac{a_{51}}{a_{11}} (a_{11}), a_{52} - \frac{a_{51}}{a_{11}} (a_{12}), a_{53} - \frac{a_{51}}{a_{11}} (a_{13}), \dots = b_5 - \frac{a_{51}}{a_{11}} (b_1)$$

$$-3T_1 - (-3)(1) + (-1 - 3(1))T_2 + 2 - (-3(-2))T_3 + 3 - (-3(1))T_4 + 1 - (-3(3))T_5 + (3 - (-3(-1)))T_6 = 16 - 3(4)$$

$$0T_1 + 2T_2 - 4T_3 + 6T_4 + 10T_5 + 0T_6 = 28$$

$$a_{61} - \frac{a_{61}}{a_{11}} (a_{11}), a_{62} - \frac{a_{61}}{a_{11}} (a_{12}), a_{63} - \frac{a_{61}}{a_{11}} (a_{13}), \dots = b_6 - \frac{a_{61}}{a_{11}} (b_1)$$

$$4 - 4(1)T_1 + 3 - 4(1)T_2 + 1 - 4(-2)T_3 + (-6 - 4(1))T_4 + (-3 - 4(3))T_5 + -2 - 4(-1)T_6 = -27 - 4(4)$$

$$0T_1 - T_2 + 9T_3 - 10T_4 - 15T_5 + 2T_6 = -43$$

1	1	-2	1	3	-1	4
0	-3	5	0	-5	-1	12
0	2	-1	-2	-1	2	-19
0	-3	9	-6	-13	6	-23
0	2	-4	6	10	0	28
0	-1	9	-10	-15	2	-43

For 2nd row pivot (using new matrix)

$$a_{32} - \frac{a_{32}}{a_{22}} a_{22} + a_{33} - \frac{a_{32}}{a_{22}} a_{23} + a_{34} - \frac{a_{32}}{a_{22}} a_{24} + \dots =$$

$$b_3 - \frac{a_{32}}{a_{22}} (b_2)$$

$$2 - \left(\frac{2}{-3} \times -3\right) T_2 + -1 - \left(\frac{2}{-3} \times 5\right) T_3 + (-2 - \left(\frac{2}{-3} \times 0\right)) T_4 + -1 - \left(\frac{2}{-3} \times -5\right) T_5 + 2 - \left(\frac{2}{-3} \times -1\right) T_6 = -19 - \left(\frac{2}{-3} \times 12\right)$$

$$0 T_2 + \frac{7}{3} T_3 - 2 T_4 - \frac{19}{3} T_5 + \frac{7}{3} T_6 = -11$$

$$a_{42} - \frac{a_{42}}{a_{22}} a_{22} + a_{43} - \frac{a_{42}}{a_{22}} a_{23} + a_{44} - \frac{a_{42}}{a_{22}} a_{24} + \dots =$$

$$b_4 - \frac{a_{42}}{a_{22}} (b_2)$$

$$-3 - \left(\frac{2}{-3} \times -3\right) T_2 + 9 - \left(\frac{-3}{-3} \times 5\right) T_3 + -6 - \left(\frac{-3}{-3} \times 0\right) T_4 + (-13 - \left(\frac{-3}{-3} \times -5\right) T_5) + 6 - \left(\frac{-3}{-3} \times -1\right) T_6 = -23 - \left(\frac{-3}{-3} \times 12\right)$$

$$0 T_2 + 4 T_3 - 6 T_4 - 8 T_5 + 7 T_6 = -35$$

$$a_{52} - \frac{a_{52}}{a_{22}} a_{22} + a_{53} - \frac{a_{52}}{a_{22}} a_{23} + a_{54} - \frac{a_{52}}{a_{22}} a_{24} + \dots = b_5 - \left(\frac{a_{52}}{a_{22}}\right) (b_2)$$

$$2 - \left(\frac{2}{-3} \times -3\right) T_2 + -4 - \left(\frac{2}{-3} \times 5\right) T_3 + 6 - \left(\frac{2}{-3} \times 0\right) T_4 + 10 - \left(\frac{2}{-3} \times -5\right) T_5 +$$

$$0 - \left(\frac{2}{-3} \times -1\right) T_6 = 28 - \left(\frac{2}{-3} \times 12\right)$$

$$0 T_2 - \frac{2}{3} T_3 + 6 T_4 + \frac{20}{3} T_5 - 2 T_6 = 36$$

$$a_{62} - \frac{a_{62}}{a_{22}} a_{22} + a_{63} - \frac{a_{62}}{a_{22}} a_{23} + a_{64} - \frac{a_{62}}{a_{22}} a_{24} + \dots = b_6 - \left(\frac{a_{62}}{a_{22}}\right) (b_2)$$

$$-1 - \left(\frac{-1}{-3} \times -3\right) T_2 + 9 - \left(\frac{-1}{-3} \times 5\right) T_3 + -10 - \left(\frac{-1}{-3} \times 0\right) T_4 - 15 - \left(\frac{-1}{-3} \times -5\right) T_5 +$$

$$4 + 2 - \left(\frac{-1}{-3} \times -1\right) T_6 = -43 - \left(\frac{-1}{-3} \times 12\right)$$

$$0 T_2 + \frac{22}{3} T_3 - 10 T_4 - \frac{40}{3} T_5 + 7 T_6 = -47$$



$$\left[ \begin{array}{cccccc|c} 1 & -2 & 1 & 3 & -1 & 4 \\ 2 & -1 & 1 & 2 & 1 & -3 & 20 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 & -11 \\ 0 & 0 & 4 & -6 & -8 & 7 & -35 \\ 0 & 0 & -2/3 & 6 & 20/3 & -2/3 & 36 \\ 0 & 0 & 22/3 & -10 & -40/3 & 7/3 & -47 \end{array} \right]$$

Making row 3 pivot row and using new matrix

$$a_{43} - a_{43} \frac{a_{33}}{a_{33}} + a_{44} - \frac{a_{43} a_{34}}{a_{33}} + a_{45} - \frac{a_{43} a_{35}}{a_{33}} + \dots = b_4 - \frac{a_{43} b_3}{a_{33}}$$

$$4 - \left( \frac{4}{7/3} \times 7/3 \right) T_3 + -6 - \left( \frac{4}{7/3} \times 2 \right) T_4 - 8 - \left( \frac{4}{7/3} \times -13/3 \right) T_5 +$$

$$-7 - \left( \frac{4}{7/3} \times 4/3 \right) T_6 = -35 - \left( \frac{4}{7/3} \times -11 \right)$$

$$0 T_3 - 18 T_4 - 4 T_5 + 33 T_6 = -113$$

$$a_{53} - a_{53} \frac{a_{33}}{a_{33}} + a_{54} - \frac{a_{53} a_{34}}{a_{33}} + a_{55} - \frac{a_{53} a_{35}}{a_{33}} + \dots =$$

$$b_5 - \frac{a_{53} b_3}{a_{33}}$$

$$-\frac{2}{3} - \left( \frac{-2/3}{7/3} \times 7/3 \right) T_3 + 6 - \left( \frac{-2/3}{7/3} \times 2 \right) T_4 + \frac{20}{3} - \left( \frac{-2/3}{7/3} \times -13/3 \right) T_5 -$$

$$\frac{2}{3} - \left( \frac{-2/3}{7/3} \times 4/3 \right) T_6 = 36 - \left( \frac{-2/3}{7/3} \times -11 \right)$$

$$0 T_3 + \frac{38}{7} T_4 + \frac{38}{7} T_5 - \frac{2}{7} T_6 = \frac{230}{7}$$

$$a_{63} - a_{63} \frac{a_{33}}{a_{33}} + a_{64} - \frac{a_{63} a_{34}}{a_{33}} + a_{65} - \frac{a_{63} a_{35}}{a_{33}} + \dots =$$

$$b_6 - \frac{a_{63} b_3}{a_{33}}$$

$$\frac{22}{3} - \left( \frac{22/3}{7/3} \times 7/3 \right) T_3 - 10 - \left( \frac{22/3}{7/3} \times 2 \right) T_4 - \frac{40}{3} - \left( \frac{22/3}{7/3} \times -13/3 \right) T_5 +$$

$$\frac{7}{3} - \left( \frac{22/3}{7/3} \times 4/3 \right) T_6 = -47 - \left( \frac{22/3}{7/3} \times -11 \right)$$

$$0T_3 - \frac{26}{7}T_4 + \frac{2}{7}T_5 - \frac{13}{7}T_6 = -\frac{87}{7}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 & -11 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 & -113/7 \\ 0 & 0 & 0 & 38/7 & 38/7 & -2/7 & 230/7 \\ 0 & 0 & 0 & -26/7 & 2/7 & -13/7 & -87/7 \end{bmatrix}$$

making row 4 pivot row, using new matrix

$$a_{54} - \frac{a_{54}}{a_{44}} a_{44} + a_{55} - \frac{a_{54}}{a_{44}} a_{45} + a_{56} - \frac{a_{54}}{a_{44}} a_{46} + \dots =$$

$$b_5 - \left( \frac{a_{54}}{a_{44}} \right) b_4$$

$$\frac{38}{7} - \left( \frac{38/7}{-18/7} \times -18/7 \right) T_4 + \frac{38}{7} - \left( \frac{38/7}{-18/7} \times -4/7 \right) T_5 - \frac{2}{7} - \left( \frac{38/7}{-18/7} \times 33/7 \right) T_6$$

$$= \frac{230}{7} - \left( \frac{38/7}{-18/7} \times -113 \right)$$

$$0T_4 + \frac{38}{9}T_5 + \frac{29}{3}T_6 = -\frac{11}{9}$$

$$a_{64} - \frac{a_{64}}{a_{44}} a_{44} + a_{65} - \frac{a_{64}}{a_{44}} a_{45} + a_{66} - \frac{a_{64}}{a_{44}} a_{46} + \dots =$$

$$b_6 - \left( \frac{a_{64}}{a_{44}} \right) b_4$$

$$-\frac{26}{7} - \left( \frac{-26/7}{-18/7} \times -18/7 \right) T_4 + \frac{2}{7} - \left( \frac{-26/7}{-18/7} \times -4/7 \right) T_5 - \frac{13}{7} - \left( \frac{-26/7}{-18/7} \times 33 \right) T_6$$

$$\frac{33}{7} T_6 = \frac{-87}{7} - \left( \frac{-26/7}{-18/7} \times -113 \right)$$

$$0T_4 + \frac{10}{9}T_5 - \frac{26}{3}T_6 = \frac{98}{9}$$

making row 5 pivot

$$\left[ \begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 & -11 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 & -113/7 \\ 0 & 0 & 0 & 0 & 38/9 & 29/3 & -11/9 \\ 0 & 0 & 0 & 0 & 10/9 & -26/3 & 98/9 \end{array} \right]$$

making rows post ad using new matrix  
 $a_{65} - a_{65} \quad a_{55} + a_{66} - a_{65} \quad a_{56} \pm b_6 \left( \frac{a_{65}}{a_{55}} \right) b_5$

$$\frac{10}{9} - \left( \frac{10/9}{38/9} \times \frac{38/9}{9} \right) T_5 - \frac{26}{3} - \left( \frac{10/9}{38/9} \times \frac{29/3}{9} \right) T_6 = \frac{98}{9} \left( \frac{10/9}{38/9} \times -\frac{11/9}{9} \right)$$

$$0 T_5 - \frac{213}{9} T_6 = \frac{213}{19}$$

$$\left[ \begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 7/3 & -2 & 13/3 & 4/3 & -11 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 & -113/7 \\ 0 & 0 & 0 & 0 & 38/9 & 29/3 & -11/9 \\ 0 & 0 & 0 & 0 & 0 & -\frac{213}{19} & \frac{213}{19} \end{array} \right]$$

using backward substitution, (in new matrix)  
 from eqn (6)

$$\frac{-213}{19} T_6 = \frac{213}{19}$$

$$T_6 = \frac{213}{19} \times \frac{19}{-213}$$

$$\therefore T_6 = -1$$

Sub into eqn (5)

$$\frac{38}{9} T_5 + \frac{29}{3} T_6 = -\frac{11}{9}$$

$$\frac{38 T_5 = 76}{9 \quad 9}$$

$$T_5 = 2$$

sub into eqn (4)

$$-\frac{18}{7} T_4 - \frac{4}{7} T_5 + \frac{33}{7} T_6 = -\frac{113}{7}$$

$$-\frac{18}{7} T_4 - \frac{4}{7} (2) + \frac{33}{7} (-1) = -\frac{113}{7}$$

$$-\frac{18}{7} T_4 = -\frac{113}{7} + \frac{8}{7} - \frac{33}{7}$$

$$-\frac{18}{7} T_4 = -\frac{72}{7}$$

$$T_4 = 4$$

sub into eqn (3)

$$\frac{7}{3} T_3 - 2 T_4 - \frac{13}{3} T_5 + \frac{4}{3} T_6 = -11$$

$$\frac{7}{3} T_3 - 2(4) - \frac{13}{3}(2) + \frac{4}{3}(-1) = -11$$

$$\frac{7}{3} T_3 = -11 + 8 + \frac{26}{3} + \frac{4}{3}$$

$$\frac{7}{3} T_3 = 7$$

$$T_3 = 3$$

sub into eqn (2)

$$-3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$$

$$-3T_2 + 5(3) + 0(4) - 5(2) - 1(-1) = 12$$

$$-3T_2 + 15 + 0 - 10 + 1 = 12$$

$$-3T_2 + 6 = 12$$

$$-3T_2 = 12 - 6$$

$$-3T_2 = 6$$

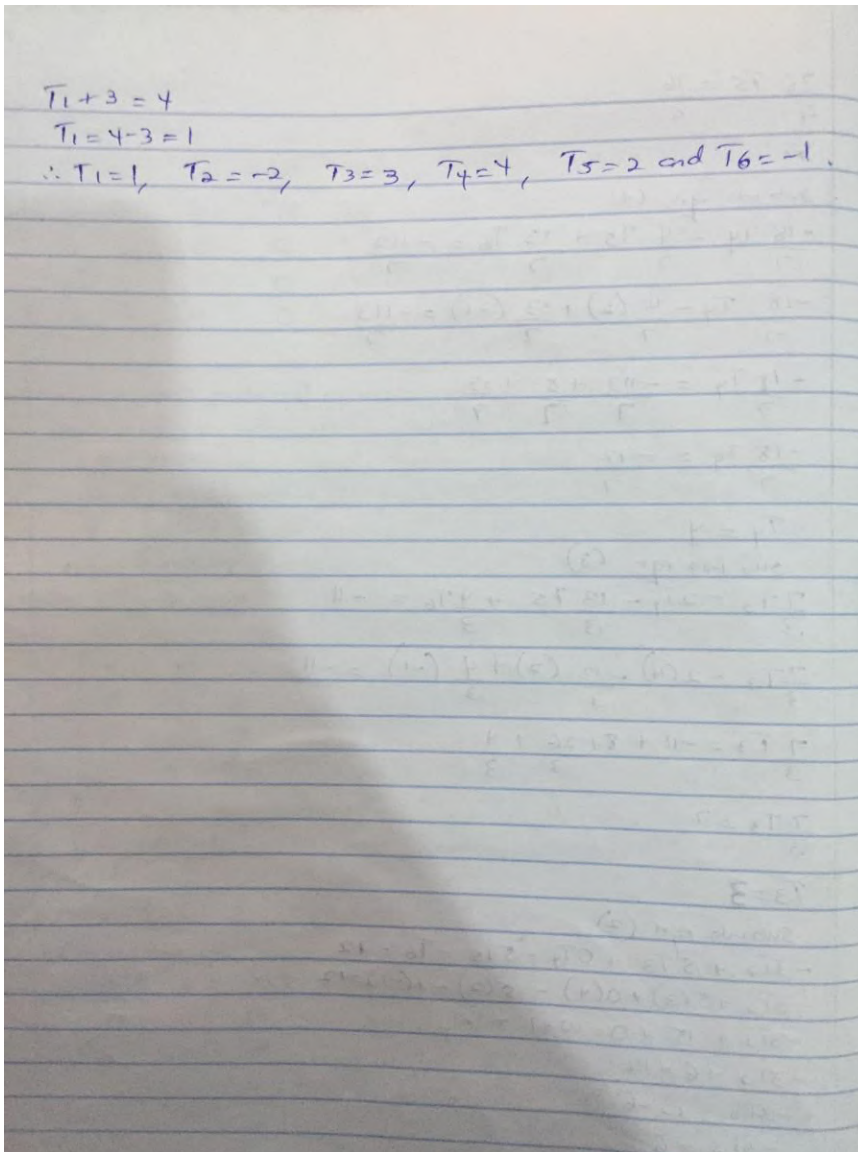
$$T_2 = -2$$

sub into eqn (1)

$$T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4$$

$$T_1 + 1(-2) - 2(3) + 4 + 3(2) - (-1) = 4$$





## MATLAB CODE

```
commandwindow
clear
clc
format short g
B = [4; 20; -15; -3; 16; -27];
a = [1 1 -2 1 3 -1
     2 -1 1 2 1 -3
     1 3 -3 -1 2 1
     5 2 -1 -1 2 1
     -3 -1 2 3 1 3
     4 3 1 -6 -3 -2]
Fla = [a(2,1)/a(1,2)]
```





```

b3aa =b3a-(F2*b2a)
b4aa =b4a-(F3*b2a)
b5aa =b5a-(F4*b2a)
b6aa =b6a-(F5*b2a)
Aaa=[1  1 -2   1   3   -1
      0 -3  5   0  -5   -1
      0  0 7/3  -2 -13/3 4/3
      0  0  4  -6  -8   7
      0  0 -2/3  6 20/3 -2/3
      0  0 22/3 -10 -40/3 7/3]
F33=[Aaa(4,3)/Aaa(3,3)]
F44=[Aaa(5,3)/Aaa(3,3)]
F55=[Aaa(6,3)/Aaa(3,3)]
A3 =[1                                     1                                     -2
1                                     3                                     -1
0                                     5                                     -1
-2                                    0                                     2.3333
0                                     -4.3333                            1.3333
Aaa(4,4)-(F33*Aaa(3,4))  Aaa(4,5)-(F33*Aaa(3,5))  Aaa(4,6)-
(F33*Aaa(3,6))
0                                     0                                     Aaa(4,3)-(F33*Aaa(3,3))
Aaa(5,4)-(F44*Aaa(3,4))  Aaa(5,5)-(F44*Aaa(3,5))  Aaa(5,6)-
(F44*Aaa(3,6))
0                                     0                                     Aaa(5,3)-(F44*Aaa(3,3))
Aaa(6,4)-(F55*Aaa(3,4))  Aaa(6,5)-(F55*Aaa(3,5))  Aaa(6,6)-
(F55*Aaa(3,6))]

b4aaa =b4aa-(F33*b3aa)
b5aaa =b5aa-(F44*b3aa)
b6aaa =b6aa-(F55*b3aa)
Aaaa=[1  1  -2   1   3   -1
       0  -3  5   0  -5   -1
       0  0  7/3  -2  -13/3 4/3
       0  0  0  -18/7  -4/7 33/7
       0  0  0  38/7  38/7 -2/7
       0  0  0  -26/7  2/7  -13/7]
F444=[Aaaa(5,4)/Aaaa(4,4)]
F555=[Aaaa(6,4)/Aaaa(4,4)]
A4 =[1                                     1                                     -2
1                                     3                                     -1
0                                     5                                     -1
-2                                    0                                     2.3333
0                                     -4.3333                            1.3333
-2.5714                             -0.57143                             4.7143
0                                     0                                     Aaaa(5,4)-
(F444*Aaaa(4,4))  Aaaa(5,5)-(F444*Aaaa(4,5))  Aaaa(5,6)-
(F444*Aaaa(4,6))

```

```

0 0 0 Aaaa(6,4) -
(F555*Aaaa(4,4)) Aaaa(6,5) - (F555*Aaaa(4,5)) Aaaa(6,6) -
(F555*Aaaa(4,6)) ]
b5aaaa =b5aaa-(F444*b4aaa)
b6aaaa =b6aaa-(F555*b4aaa)
Aaaaa=[1 1 -2 1 3 -1
0 -3 5 0 -5 -1
0 0 7/3 -2 -13/3 4/3
0 0 0 -18/7 -4/7 33/7
0 0 0 0 38/9 29/3
0 0 0 0 10/9 -26/3]
F5555=[Aaaaa(6,5)/Aaaaa(5,5)]
A5 =[1 1 -2 1 3 -
1 0 -3 5 0 -5 -
1 0 0 2.3333 -2 -4.333
1.333 0 0 0 -2.5714 -
0.57143 4.7143 0 0 0 0
0 0 4.2222 0 9.6667
0 0 0 0 0 0
0 Aaaaa(6,5) - (F5555*Aaaaa(5,5)) Aaaaa(6,6) -
(F5555*Aaaaa(5,6)) ]

b6aaaaa =b6aaaa-(F5555*b5aaaa)
x6=b6aaaaa/A5(6,6)
x5=(b5aaaa-(A5(5,6)*x6))/A5(5,5)
x4=(b4aaa-((Aaaa(4,5))*x5)-((Aaaa(4,6))*x6))/Aaaa(4,4)
x3=((b3aa-((Aaa(3,6))*x6)-((Aaa(3,5))*x5)-((Aaa(3,4))*x4))/Aaa(3,3)
x2=((b2a-(Aa(2,3)*x3)-(Aa(2,4)*x4)-(Aa(2,5)*x5)-(Aa(2,6)*x6))/Aa(2,2)
x1=(b1-(a(1,2)*x2)-(a(1,3)*x3)-(a(1,4)*x4)-(a(1,5)*x5)-
(a(1,6)*x6))/a(1,1)

```

MATLAB SOLUTION

a =

```

1 1 -2 1 3 -1
2 -1 1 2 1 -3
1 3 -3 -1 2 1
5 2 -1 -1 2 1
-3 -1 2 3 1 3
4 3 1 -6 -3 -2

```

F1a =

2

$$F2a =$$

1

$$F3a =$$

5

$$F4a =$$

-3

$$F5a =$$

4

$$a =$$

1	1	-2	1	3	-1
0	-3	5	0	-5	-1
0	2	-1	-2	-1	2
0	-3	9	-6	-13	6
0	2	-4	6	10	0
0	-1	9	-10	-15	2

$$b2a =$$

12

$$b3a =$$

-19

$$b4a =$$

-23

$$b5a =$$



28

b6a =

-43

Aa =

1	1	-2	1	3	-1
0	-3	5	0	-5	-1
0	2	-1	-2	-1	2
0	-3	9	-6	-13	6
0	2	-4	6	10	0
0	-1	9	-10	-15	2

F2 =

-0.66667

F3 =

1

F4 =

-0.66667

F5 =

0.33333

A2 =

	1	1	-2	1	
3	-1				
	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				

-8	0	0	4	-6
	7			
6.6667	0	0	-0.66667	6
	-0.66667			
141	0	0	7.3333	-10
	2.3333			

b3aa =

-11

b4aa =

-35

b5aa =

36

b6aa =

-47

Aaa =

3	1	1	-2	1	
	-1				
-5	0	-3	5	0	
	-1				
4.3333	0	0	2.3333	-2	-
	1.3333				
-8	0	0	4	-6	
	7				
6.6667	0	0	-0.66667	6	
	-0.66667				
13.333	0	0	7.3333	-10	-
	2.3333				

F33 =

1.7143

F44 =

-0.28571

F55 =

3.1429

A3 =

	1	1	-2	1	
3	-1				
	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				
	0	0	0	-2.5714	-
0.57143	4.7143				
	0	0	0	5.4286	
5.4286	-0.28571				
	0	0	0	-3.7143	
0.28571	-1.8571				

b4aaa =

-16.143

b5aaa =

32.857

b6aaa =

-12.429

Aaaa =

	1	1	-2	1	
3	-1				

	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				
	0	0	0	-2.5714	-
0.57143	4.7143				
	0	0	0	5.4286	
5.4286	-0.28571				
	0	0	0	-3.7143	
0.28571	-1.8571				

F444 =

-2.1111

F555 =

1.4444

A4 =

	1	1	-2	1	
3	-1				
	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				
	0	0	0	-2.5714	-
0.57143	4.7143				
	0	0	0	0	
4.2222	9.6667				
	0	0	0	0	
1.1111	-8.6667				

b5aaaa =

-1.2222

b6aaaa =

10.889



Aaaaa =

	1	1	-2	1	
3	-1				
	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				
	0	0	0	-2.5714	-
0.57143	4.7143				
	0	0	0	0	
4.2222	9.6667				
	0	0	0	0	
1.1111	-8.6667				

F5555 =

0.26316

A5 =

	1	1	-2	1	
3	-1				
	0	-3	5	0	
-5	-1				
	0	0	2.3333	-2	-
4.3333	1.3333				
	0	0	0	-2.5714	-
0.57143	4.7143				
	0	0	0	0	
4.2222	9.6667				
	0	0	0	0	
0	-11.211				

b6aaaaa =

11.211

x6 =

-1

x5 =

2

x4 =

4

x3 =

3

x2 =

-2

x1 =

0.99999

**EXCEL INVERSE METHOD**

						A			T	b
1	1	-2	1	3	-1	T1	4			
2	-1	1	2	1	-3	T2	20			
1	3	-3	-1	2	1	T3	-15			
5	2	-1	-1	2	1	T4	-3			
-3	-1	2	3	1	3	T5	16			
4	3	1	-6	-3	-2	T6	-27			
						INV			T	
-	-	-	-	-	-					
0.302	0.154	0.084	0.197	0.105	0.098					
82	93	507	183	63	59	T1	1			
-	-	-	-	-	-					
0.549	0.544	0.812	0.215	0.234	0.107					
3	601	207	96	742	981	T2	-2			
-	-	-	-	-	-					
0.330	0.037	0.262	0.002	0.328	0.251					
986	56	91	35	638	174	T3	3			
-	-	-	-	-	-					
0.915	0.685	0.798	0.082	0.002	0.208					
49	446	122	16	347	92	T4	4			
1.091	-	-	0.091	0.183	0.204	T5	2			

549	0.535	0.746	549	099	225		
	21	48					
-	-	-					
0.154	0.145	0.018	0.178	0.023	0.089		
93	54	78	404	474	2	T6	-1

**GAUSS METHOD ON EXCEL**

A			T			B
1	1	-2	1	3	-1	T1 4
2	-1	1	2	1	-3	T2 20
1	3	-3	-1	2	1	T3 -15
5	2	-1	-1	2	1	T4 -3
-3	-1	2	3	1	3	T5 16
4	3	1	-6	-3	-2	T6 -27

A			B			Factor
1	1	-2	1	3	-1	4 2
0	-3	5	0	-5	-1	12 1
0	2	-1	-2	-1	2	-19 5
0	-3	9	-6	-13	6	-23 -3
0	2	-4	6	10	0	28 4
0	-1	9	-10	-15	2	-43

A			B			Factor
1	1	-2	1	3	-1	4 0.6666
-						7
0	3	5	0	-5	-1	12 1
	2.33333		4.3333	1.3333		
0	0	3	-2	3	33	-11
0	0	4	-6	-8	7	-35 0.6666
						7
			6.6666	0.6666		0.3333
0	0	0.66667	6	67	7	36 33
	7.33333		13.333	2.3333		
0	0	3	-10	3	33	-47

			A		B	Factor
1	1	-2	1	3	-1	4 1.7142
	-					86
0	3	5	0	-5	-1	12 0.2857
				-		1
0	0	2.33333		4.3333	1.3333	3.1428
		3	-2	3	33	-11 57
			-	-		
0	0	0	2.5714	0.5714	4.7142	16.142
			3	3	86	9
					-	
0	0	0	5.4285	5.4285	0.2857	32.857
			71	71	1	14
			-		-	-
0	0	0	3.7142	0.2857	1.8571	12.428
			9	14	4	6

			A		B	Factor
1	1	-2	1	3	-1	4 -2.11111
	-					
0	3	5	0	-5	-1	12 1.444444
0	0	2.33333	-2	-4.33333	1.33333	-11
			-			
0	0	0	2.57143	-0.57143	4.71429	-16.1429
0	0	0	0	4.22222	9.66667	-1.22222
0	0	0	0	1.11111	-8.66667	10.88889

			A		B	Factor
1	1	-2	1	3	-1	4 0.263158
	-					
0	3	5	0	-5	-1	12
0	0	2.33333	-2	-4.33333	1.33333	-11
			-			
0	0	0	2.57143	-0.57143	4.71429	-16.1429
0	0	0	0	4.22222	9.66667	-1.22222
0	0	0	0	0	-11.2105	11.21053

T6 -1  
T5 2.000001  
T4 4  
T3 2.999998



```
T2          -2
T1    0.999999
```

### MATLAB INVERSE METHOD

```
commandwindow
```

```
clear
```

```
clc
```

```
format short g
```

```
B=[4; 20; -15; -3; 16; -27]
```

```
a= [ 1   1   -2   1   3   -1
     2  -1   1   2   1  -3
     1   3  -3  -1   2   1
     5   2  -1  -1   2   1
    -3  -1   2   3   1   3
     4   3   1  -6  -3  -2]
```

```
g = inv(a)
```

```
T =g*B
```

```
B =
```

```
4
20
-15
-3
16
-27
```

```
a =
```

```
1   1   -2   1   3   -1
2  -1   1   2   1  -3
1   3  -3  -1   2   1
5   2  -1  -1   2   1
-3  -1   2   3   1   3
4   3   1  -6  -3  -2
```

```
g =
```

```
-0.30282    0.15493    0.084507    0.19718    -
0.10563    -0.098592
-0.5493    0.5446    0.81221    -0.21596
0.23474    0.10798
0.33099    -0.037559    -0.26291    -0.0023474
0.32864    0.25117
-0.91549    0.68545    0.79812    -0.08216
0.0023474    -0.20892
1.0915    -0.53521    -0.74648    0.091549
0.1831    0.20423
```

-0.15493      -0.14554      -0.018779      0.1784  
0.023474      -0.089202  
T =

1  
-2  
3  
4  
2  
-1