Example № (7):
For the given space truss make the modeling and find the overall load vector by using stiffness matrix method?

Solution:

(1) **Modeling:** \( \text{NN} = (11) \)

\( \text{NM} = (45) \)

D.O.F. = 24 \( \{F\}_{24*1} = [K]_{24*24} * \{D\}_{24*1} \)

(2) **Load vector:**

\( \{F\}_{36*1}^T = \begin{bmatrix} 0 & 0 & -6 & 0 & 0 & -6 & 0 & 0 & -6 & 0 & 0 & 0 & -4 & 0 & 0 & -4 & 0 & 0 \\ 0 & 0 & -6 \end{bmatrix}^T \)

Joint (2) (3) (4) (5) (6) (9) (10)

(11)
Solution:

Modeling:

N.N. = 28
N.M. = 100
D.O.F = (3*24) = 72

Equilibrium Equation:

\[ \{f\}^{72*1} = [k]^{72*1} \times \{f\}^{72*1} \]

Overall Load Vector:

\[ \{f\}^{72*1} = \{6 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \}\]