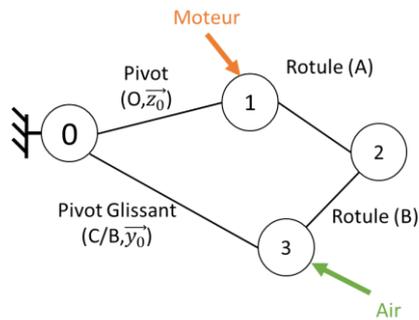


## TD – Compresseur

### ELEMENTS DE CORRECTION :

**Q1 :**



**Q2 :**

$$\{\tau_{3 \rightarrow 2}\} = \begin{Bmatrix} X_{32} & 0 \\ Y_{32} & 0 \\ Z_{32} & 0 \end{Bmatrix}_{B,R_0}$$

**Q3 :**

$$\{\tau_{1 \rightarrow 2}\} = \begin{Bmatrix} X_{12} & 0 \\ Y_{12} & 0 \\ Z_{12} & 0 \end{Bmatrix}_{A,R_0}$$

**Q4 :**

PFS en B

$$\begin{cases} X_{32} + X_{12} = 0 & (1) \\ Y_{32} + Y_{12} = 0 & (2) \\ Z_{32} + Z_{12} = 0 & (3) \\ 0 - L \cdot Z_{12} \cdot \cos\beta = 0 & (4) \\ 0 - L \cdot Z_{12} \cdot \sin\beta = 0 & (5) \\ 0 + L \cdot X_{12} \cdot \cos\beta + L \cdot Y_{12} \cdot \sin\beta = 0 & (6) \end{cases}$$

**Q5 :**

$$\{\tau_{2 \rightarrow 1}\} = \begin{Bmatrix} -X_{12} & 0 \\ -Y_{12} & 0 \\ -Z_{12} & 0 \end{Bmatrix}_{A,R_0}$$

**Q6 :**

$$\{\tau_{0 \rightarrow 1}\} = \begin{pmatrix} X_{01} & L_{01} \\ Y_{01} & M_{01} \\ Z_{01} & 0 \end{pmatrix}_{O,R_0}$$

**Q7 :**

$$\{\tau_{mot \rightarrow 1}\} = \begin{pmatrix} 0 & 0 \\ 0 & 0 \\ 0 & C_m \end{pmatrix}_{O,R_0}$$

**Q8 :**

PFS en 0

$$\begin{cases} -X_{12} + X_{01} + 0 = 0 & (7) \\ -Y_{12} + Y_{01} + 0 = 0 & (8) \\ -Z_{12} + Z_{01} + 0 = 0 & (9) \\ Z_{12} \cdot R \cdot \cos\theta + L_{01} + 0 = 0 & (10) \\ Z_{12} \cdot R \cdot \sin\theta + M_{01} + 0 = 0 & (11) \\ -Y_{12} \cdot R \cdot \cos\theta + X_{12} \cdot R \cdot \sin\theta + 0 + C_m = 0 & (12) \end{cases}$$

**Q9 :**

$$\{\tau_{2 \rightarrow 3}\} = \begin{pmatrix} -X_{32} & 0 \\ -Y_{32} & 0 \\ -Z_{32} & 0 \end{pmatrix}_{B,R_0}$$

**Q10 :**

$$\{\tau_{0 \rightarrow 3}\} = \begin{pmatrix} X_{03} & L_{03} \\ 0 & 0 \\ Z_{03} & N_{03} \end{pmatrix}_{B,R_0}$$

**Q11 :**

$$\{\tau_{Air \rightarrow 3}\} = \begin{pmatrix} 0 & 0 \\ -p \cdot S & 0 \\ 0 & 0 \end{pmatrix}_{B,R_0}$$

**Q12 :**

PFS en B

$$\begin{cases} -X_{32} + X_{03} + 0 = 0 & (13) \\ -Y_{32} + 0 - p.S = 0 & (14) \\ -Z_{32} + Z_{03} + 0 = 0 & (15) \\ 0 + L_{03} + 0 = 0 & (16) \\ 0 + 0 + 0 = 0 & (17) \\ 0 + N_{03} + 0 = 0 & (18) \end{cases}$$

**Q13 :**

$$(4) \text{ et } (5) \rightarrow Z_{12} = 0$$

$$(14) \rightarrow p.S = -Y_{32}$$

$$(2) \rightarrow Y_{12} = -Y_{32}$$

$$\text{Donc } p.S = Y_{12}$$

$$(12) \rightarrow C_m = -Y_{12}.R.\cos\theta + X_{12}.R.\sin\theta$$

$$(6) \rightarrow X_{12}.\cos\beta = -Y_{12}.\cos\beta$$

$$\text{Donc } Y_{12} = -\frac{X_{12}}{\tan\beta}$$

$$\text{Donc } C_m = p.S.R(\cos\theta + \sin\theta.\tan\beta)$$