Engineering Optimization Homework

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1 Structurally Minimal Supervisors

$|R(N, M_0)| = 20$

$|M_L| = 15$

$|M_{FBM}| = 5$

$|M^*_{FBM}| = 3$

$|M^*_L| = 2$

$M^*_{FBM} = \{p_2 + p_5, p_3 + p_5, p_2 + p_6\}$

$M^*_L = \{p_2 + p_3 + p_4, p_5 + p_6 + p_7\}$

Answer :

$$M^*_{FBM} = \{p_2 + p_5, p_3 + p_5, p_2 + p_6\} = \{M_1, M_2, M_3\}$$

$$M^*_L = \{p_2 + p_3 + p_4, p_5 + p_6 + p_7\} = \{M_4, M_5\}$$

$$\max f = \sum_{k \in \mathbb{N}^*_{FBM}, k \neq j}^{f_k} = f_1 + f_2 + f_3$$

$$l_2 + l_3 + l_4 \leq \beta \qquad M_4$$

$$l_5 + l_6 + l_7 \leq \beta \qquad M_5$$

$$l_2 + l_5 \leq \beta + 1 + Q(1 - f_1) \qquad M_1$$

$$l_3 + l_5 \leq \beta + 1 + Q(1 - f_2) \qquad M_2$$

$$l_2 + l_6 \leq \beta + 1 + Q(1 - f_3) \qquad M_3$$