

$$y = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_m \end{bmatrix} \quad (1)$$

$$[p_1^2 q_1^2 \quad (2)$$

$$p_1^2 q_1 (1 - q_1) \quad (3)$$

$$p_1 q_1^2 (1 - p_1) \quad (4)$$

$$p_1 q_1 (p_1 - 1) (q_1 - 1) \quad (5)$$

$$p_1^2 q_1 (1 - q_1) \quad (6)$$

$$p_1^2 (q_1 - 1)^2 \quad (7)$$

$$p_1 q_1 (p_1 - 1) (q_1 - 1) \quad (8)$$

$$- p_1 (p_1 - 1) (q_1 - 1)^2 \quad (9)$$

$$p_1 q_1^2 (1 - p_1) \quad (10)$$

$$p_1 q_1 (p_1 - 1) (q_1 - 1) \quad (11)$$

$$q_1^2 (p_1 - 1)^2 \quad (12)$$

$$- q_1 (p_1 - 1)^2 (q_1 - 1) \quad (13)$$

$$p_1 q_1 (p_1 - 1) (q_1 - 1) \quad (14)$$

$$- p_1 (p_1 - 1) (q_1 - 1)^2 \quad (15)$$

$$- q_1 (p_1 - 1)^2 (q_1 - 1) \quad (16)$$

$$(p_1 - 1)^2 (q_1 - 1)^2] \quad (17)$$