Let $X^{(1)}$ and $X^{(2)}$ have nonsingular form $\underset{(p\times p)}{C}\underset{(p\times 1)}{X^{(1)}}$ and $\underset{(q\times q)}{D}\underset{(q\times 1)}{X^{(2)}}$.

Then the covariance matrix is given below,

$$\operatorname{Cov}\left(\left[\begin{array}{c} CX^{(1)} \\ \hline DX^{(2)} \end{array}\right]\right) = \left[\begin{array}{c|c} C\Sigma_{11}C' & C\Sigma_{11}D' \\ \hline D\Sigma_{11}C' & D\Sigma_{11}D' \end{array}\right]$$

Consider the linear transformation given below,

$$a_1^{'}\left(CX^{(1)}\right) = a'X^{(1)} \text{ with } a' = a_1^{'}C$$

$$b_1^{'}\left(DX^{(2)}\right) = b'X^{(2)} \text{ with } b' = b_1^{'}D$$

Then using result 10.1,

The correlation will be as given below,

$$\max_{a,b} Corr\left(a'X^{(1)}, b'X^{(2)}\right) = \rho_1^*$$

It will attain maximum by the linear combinations (first canonical variate pair) as given below,

$$a_1^{'} = e'\Sigma_{11}^{-1/2}C^{-1}$$
$$b_1^{'} = f'\Sigma_{22}^{-1/2}D^{-1}$$

Hence the canonical correlations are invariant under nonsingular transformations.