

STAT 705 Test 1 Formula Sheet

$$Y_{i.} = \sum_{j=1}^{n_i} Y_{ij}, \quad \bar{Y}_{i.} = \frac{Y_{i.}}{n_i}, \quad Y_{..} = \sum_{i=1}^r \sum_{j=1}^{n_i} Y_{ij}, \quad \bar{Y}_{..} = \frac{Y_{..}}{n_T}$$

$$SSTO = \sum_i \sum_j (Y_{ij} - \bar{Y}_{..})^2$$

$$SSTR = \sum_i n_i (\bar{Y}_{i.} - \bar{Y}_{..})^2$$

$$MSTR = \frac{SSTR}{r-1}$$

$$SSE = \sum_i \sum_j (Y_{ij} - \bar{Y}_{i.})^2$$

$$MSE = \frac{SSE}{n_T - r}$$

$$\Delta = \max(\mu_i) - \min(\mu_i)$$

$$\bar{Y}_{i.} \pm t_{(1-\alpha/2, n_T-r)} \sqrt{\frac{MSE}{n_i}}$$

$$(\bar{Y}_{i.} - \bar{Y}_{i'.}) \pm t_{(1-\alpha/2, n_T-r)} \sqrt{MSE \left(\frac{1}{n_i} + \frac{1}{n_{i'}} \right)}$$

$$\hat{L} \pm t_{(1-\alpha/2, n_T-r)} \sqrt{MSE \sum_i \frac{c_i^2}{n_i}}$$

where $L = c_1 \mu_1 + c_2 \mu_2 + \dots + c_r \mu_r$

$$(\bar{Y}_{i.} - \bar{Y}_{i'.}) \pm T \sqrt{MSE \left(\frac{1}{n_i} + \frac{1}{n_{i'}} \right)}, \quad T = \frac{1}{\sqrt{2}} q_{(1-\alpha, r, n_T-r)}$$

$$q^* = \frac{\sqrt{2} |\bar{Y}_{i.} - \bar{Y}_{i'.}|}{\sqrt{MSE \left(\frac{1}{n_i} + \frac{1}{n_{i'}} \right)}}$$

$$\hat{L}_1 \pm t_{(1-\alpha/2g; n_T-r)} [s(\hat{L}_1)]$$

$$\vdots$$
$$\hat{L}_g \pm t_{(1-\alpha/2g; n_T-r)} [s(\hat{L}_g)]$$

$$r_{ij} = \frac{e_{ij}}{\sqrt{\frac{MSE(n_i-1)}{n_i}}}$$