Standard Errors and Critical Differences:

Estimate of S.E. of difference between two A level means = $\sqrt{\dfrac{2E_a}{rb}}$

Estimate of S.E. of difference between two B level means = $\sqrt{\dfrac{2E_b}{ra}}$

Estimate of S.E. of difference between two A level means at the same level of B means

$= \sqrt{\dfrac{2[(b-1)E_c + E_a]}{rb}}$

Estimate of S.E. of difference between two B level means at the same level of A means

$= \sqrt{\dfrac{2[(a-1)E_c + E_b]}{ra}}$

Critical difference is obtained by multiplying the $S.E_d$ by $t_{5\%}$ table value for respective error d.f. for (i) & (ii). For (iii) & (iv), as the standard error of mean difference involves two error terms, we use the following equation to compute the weighted t values:

$$t = \frac{(b-1)E_c t_c + E_a t_a}{(b-1)E_c + E_a} \text{ , and } t = \frac{(a-1)E_c t_c + E_b t_b}{(a-1)E_c + E_b} \text{ respectively,}$$

where t_a, t_b, and t_c are t-values at error d.f. (E_a), error d.f.(E_b) and error d.f.(E_c) respectively.