NOTE: R is not needed for this, but it can be used to do calculations. A spreadsheet is better

The following results are reported

Source df SS MS

A 2 200 100

B 3 160 53.33

C 2 400 200

AB 6 60 10

AC 4 80 20

ABC 12 30 2.5

Error 689 400 .580

1. Determine eta squared values
2. How many subjects per cell?
3. Assuming all factors are fixed
   1. Create EMS table and EMS Equations
   2. Calculate variance components for all factors
   3. Calculate F values
4. Assuming A is fixed and B and C are random
   1. Calculate variance components for all factors
   2. Calculate F values
5. Assuming A, B, and C are random
   1. Calculate variance components for all factors
   2. Calculate F values
6. See spreadsheet
7. Total df = 239, N=240, n per cell = 20

In all problems below, n = 20, p = 3 (# levels of A), q=4,r=3

EMSA = nqrA  + error

EMSB = nprB  + error

EMSC = npqC  + error

EMSAB =nrAB  + error

EMSAC =nqAC + error

EMSBC = npBC + error

EMSABC =nABC +error

EMSerror = error

Note: ABC. – MS is 2.5, so

* 1. = 20ABC + 2

.5 = 20ABC

ABC = .5/20= .025

4.

EMSA = nqrA  + nrAB + nABC + error

EMSB = nprB  + npBC + error

EMSC = npqC  + npBC + error

EMSAB =nrAB  + nABC + error

EMSAC =nqAC + error

EMSBC = npBC + error

EMSABC =nABC +error

EMSerror = error

5.

EMSA = error + nABC + nrAB + nqAC + nqrA

EMSB = error + nABC + nps2BC + nrAB + nprB

EMSC = error + nABC + nps2BC + nqAC + npqC

EMSAB = error + nABC + nrAB

EMSAC = error + nABC + nqAC

EMSBC = error + nABC + npBC

EMSABC = error + nABC

EMSerror = error