**10/10**

**Modern regression**

**Example of test exam : here with corrections in blue**

**(1) Create a descending sequence of values from 159 to 6, with the step size 3 (i.e. with values 159, 156, 153, 150, ..., 9, 6), and store it into a numeric variable named *xa* [2 points]**

**Command:**

**xa <- seq(159,6, by = -3)**

**(2) Create another sequence, of the same length as *xa*, in which the values 5 and 8 will be interleaved (i.e. with values 5, 8, 5, 8, ..., 5, 8), using the *rep* function; store the sequence into a numeric variable named *xb* [2 points]**

**Command:**

**xb <- rep(c('5','8'), length(xa/2))**

**xc <- rep(c('5','8'), length(xa)/2)**

**(3) Change the variable *xb* into a factor type (its values 5 and 8 will become the names of its levels) [1 point]**

**Command:**

**xb <- factor(xb, levels = c("5", "8"))**

**xb <- factor(xb)**

**(4) Import through the Clipboard the data from Excel file *vf.xls*. Store them as a data frame object named *vf* [2 points]**

**Command:**

**vf <- read.delim("clipboard", as.is= FALSE)**

**(5) Use an R function to determine the smallest and largest value of variable *Altitude* in *vf* data frame: to do so, you must use a function, not just a lookup of printed values [1 point]**

**Command:**

**Min <- min (vf$Altitude); Max <- max(vf$Altitude)**

**Values:**

**> Min**

**[1] 860**

**> Max**

**[1] 1330**

**Summary(vf$Altitude)**

**(6) Calculate the differences between the abundance of blackbird (*TurdMeru*) and ring ouzel (*TurdTorq*) at each site. Then use these difference values to compute their variance [2 points]**

**Command:**

**vf$diff <- vf$TurdMeru - vf$TurdTorq**

**vf$var <- var(vf$diff)**

**turd.diff <- with(vf, TurdeMeru – TurdTorq)**

**var(turd.diff)**

**Value:**

**0.470897**