

**STATISTICS APPLIED TO BUSINESS ADMINISTRATION**  
**ACADEMIC YEAR 2016-2017**  
**PRACTICAL EXERCISE 8 (20 MINUTES)**

Date: \_\_\_\_\_

Complete name: \_\_\_\_\_ ID number: \_\_\_\_\_

**EXERCISE 1 (10 POINTS)**

In a given neighborhood, we wish to estimate the mean expense in sports related activities per family and year. It is believed that, with regard to this specific expense, there are two clearly different types of families: the ones with larger expense, which are those families with some members younger than 35, and families with smaller expense, which are those with no members younger than 35. The total number of families in the neighborhood is 50000, with 20000 families belonging to the first type of families and 30000 to the other type. It is also known that the dispersion is larger for families with larger expense when compared to the second type of families. Based on the above, the selected method of sampling is stratified sampling of 2000 families.

1. **(3 points)** If proportional allocation is used, what would the sample size for each stratum in the population under study be?
2. **(3 points)** If it is known that the expenses quasivariances for each one of the strata are 800, for the first type of family, and 500 for the second type, compute the sample sizes for each stratum if n-optimal allocation is used.
3. **(6 points)** Compute the estimator's variance for the mean expense in leisure activities per family and year for the aforementioned two types of allocation. Comment on your response.