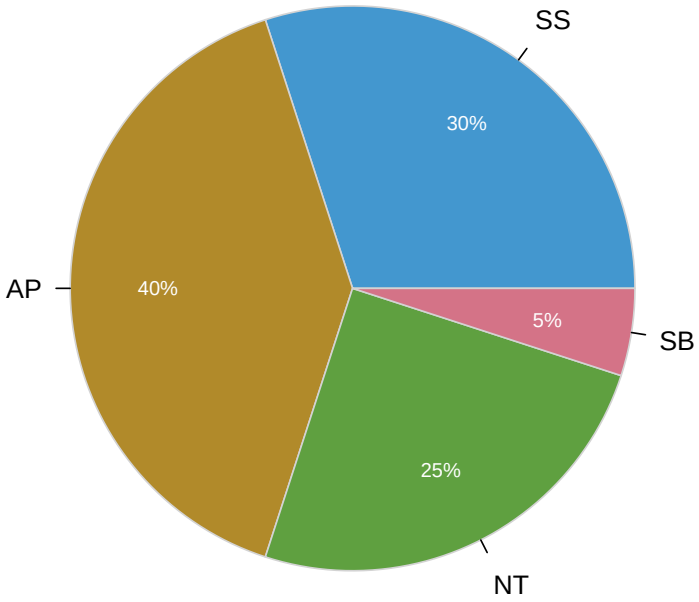
CEU	**STATISTICS EXAM**	
	2nd Physiotherapy	Name:
	Subject: Statistics	DNI:
	Date: 2023/03/23	Version B

Time: 1 hour.

1. The chart below shows the percentage of grades in a Statistic course with 60 students.



a) Plot the ogive of the score, assuming the following correspondence between grades and scores

Grade	Score
SS	$[0, 5)$
AP	$[5, 7)$
NT	$[7, 9)$
SB	$[9, 10]$

a) Compute the median and interpret it.
b) How many students got a score greater than 8?
c) Study the dispersion of the distribution.
d) Study the skewness of the distribution. Is it normal?
e) If we apply the transformation $y = 10x + 5$ to the scores, how changes the representativeness of the mean. And the skewness?

Use the following sums for the computations (X = Score):
$\sum x_i n_i = 337{,}5$, $\sum x_i^2 n_i = 2207{,}25$, $\sum (x_i - \bar{x})^3 n_i = -172{,}55$ and $\sum (x_i - \bar{x})^4 n_i = 2870{,}75$.

2. A study tries to determine if there is a relation between the gestation time (in weeks) and the age of the mother (in years). A sample of 40 mothers was taken and the sums below summarize the results (X=Age and Y=Gestation time):

   $\sum x_i = 1262$ years, $\sum \log(x_i) = 137{,}0078$ log(years), $\sum y_j = 1583{,}6$ weeks, $\sum \log(y_j) = 147{,}1305$ log(weeks),\ $\sum x_i^2 = 41862$ years^2, $\sum \log(x_i)^2 = 471{,}4222$ log(years)^2, $\sum y_j^2 = 62734{,}685$ weeks^2, $\sum \log(y_j)^2 = 541{,}2096$ log(weeks)^2,\ $\sum x_i y_j = 50116{,}7$ years·weeks, $\sum x_i \log(y_j) = 4645{,}8$ years·log(weeks), $\sum \log(x_i) y_j = 5428{,}9192$ log(years)·weeks, $\sum \log(x_i) \log(y_j) = 504{,}0696$ log(years)·log(weeks).

   a) Which regression models, linear, exponential or logarithmic, explains better the relation between the age and the gestation time?

   b) Use the best model to predict the gestation time for a mother 45 years old. Is this prediction reliable?

   c) According to the linear model, how much increases or decreases the gestation time for every year of the mother?