

 CEU	STATISTICS EXAM	
	2nd Physiotherapy	Name:
	Subject: Statistics	DNI:
	Date: 2023/04/27	Version A

Time: 1 hour.

1. A water source contaminated contains 0.1 amoebas per litre on average.
 - a) What is the probability that 2 litres of water from this source contains more than one amoeba?
 - b) If 5 persons drink 2 litres of water from this source, what is the probability of having some person infected with amoebas?
 - c) If 100 persons drink half a litre of water from this source, what is the probability that less than 5 are infected with amoebas?
2. Respiratory allergies affect 1 out of every 15 individuals in a population, while food intolerances affect 5 % of individuals. Assuming that the two problems are independent,
 - a) Compute the probability of having at least one of the problems.
 - b) Compute the probability of having an allergy but not an intolerance.
 - c) Compute the probability of having neither of the two problems.
 - d) Compute the probability of having an allergy if you have an intolerance.
3. In a population of 20000 women, it is known that back width follows a normal distribution with mean 29 cm and standard deviation 2.4 cm.
 - a) Compute the number of women with a back width greater than 32 cm.
 - b) Compute the interquartile range of women's back width and interpret it.
 - c) Compute the probability that a woman with a back width above the third quartile, has a back width above 32.
4. A diagnostic test for prostate cancer has a specificity of 80 % and produces 1.6 % of false negatives. It is known that the prevalence of prostate cancer in a population is 2 %.
 - a) Compute the sensitivity of the test. Does the outcome of the test depend on whether a man has prostate cancer?
 - b) Is this a good test to diagnose the disease?
 - c) What should be the minimum specificity of the test to diagnose the disease with a positive outcome?