

Please do not write on this exam paper and do not forget to give it back at the end of the test

Subject 19 – SEQUENCES

1°) Exponential decay. The population of a certain town has been falling at a constant rate (t %) each year. At the end of 1965, the population was 60 000 and one year after it had fallen to 57 000.

a) What is the decay rate of t ?

b) Find a model (a geometric sequence (P_n)) for the population size of the town, during the n^{th} year after 2000, (supposing that it continues to fall at a constant rate).

c) In which year shall the population fall below 10 000? Make a comment.

2°) Exponential growth. Medical researchers studying the growth of a strain (*une souche*) of bacteria observe that the number of bacteria present after t hours, is given by the formula:

$$N(t) = 40e^{1.5t}.$$

a) State the number of bacteria present at the start of the experiment.

b) How many minutes will the bacteria take to double in number? Make a comment.