

**Subject 3**  
**PROBABILITIES**

**Please don't write on the exam paper and don't forget to give back the examination paper at the end of the test.**

An opinion *poll* made in a mountainous region about the construction of a dam gives the following results :

- 65% of the interrogated persons are against the construction of the dam ;
- among the persons who are against the construction, 70% are ecologists ;
- among the persons favourable to the construction, 20% are ecologists.

We choose a person at random.

We note  $A$  the event « the interrogated person is against the construction » and  $\bar{A}$  the contrary event.

We note  $E$  the event : « the interrogated person is an ecologist ».

We note  $F$  the event « the interrogated person is against the construction and is not an ecologist ».

1°) Draw a probability tree of the situation.

2°) Determine the probabilities  $P(A)$ ,  $P_A(E)$  and  $P_{\bar{A}}(E)$

3°) a) Calculate the probability that the interrogated person is against the construction of the dam and is an ecologist.

b) Calculate the probability for an interrogated person to be in favour of the construction and to be an ecologist.

c) Deduce from this the probability that the interrogated person is an ecologist.

4°) a) Prove that the probability of  $F$  is equal to 0.195.

b) We choose at random five persons among those who have been interrogated during this poll. What is the probability that at least one of these persons is against the construction of the dam and is not an ecologist? (We suppose that the choice of these five persons is independant one from another).

**NB : a poll: un sondage.**

**A dam: un barrage.**