DISCRETE MATHEMATICS MIDTERM EXAM 16.11.2015

1) (40 pts) Find the solution of the recurrence relation : $a_n = a_{n-1} + 2a_{n-2}$ with the ini conditions $a_0 = 2$, and $a_1 = 7$.

2) (30 pts) What can you say about the sets A ~~and~~ B if $A \oplus B = A$? and $A \wedge B \Rightarrow A$

3) (30 pts) The pigeonhole principle is : "If k+1 or more objects are placed into k boxes, th there is at least one box containing two or more of the objects. "

$A \oplus B = A$

Answer the questions according to pigeonhole principle:

a) How many people must be in a group to guarantee that at least two people have the same birthday (not the year, it means the same day and month)? 360

b) How many students must be in a class to guarantee that at least two students have the same score of the exam over 100?

c) What is the minimum number of students required in a mathematics class to be sure that at least six will receive the same grade, if there are 5 possible grades, A, B, C, D and F?