Predicate Logic Formalisation

1. Assuming the following relations

term(C,T)	course C is taught in term T
compulsory(C)	course C is compulsory
prereq(C1,C2)	course C1 is a prerequisite for course C2
lecturer(X)	X is a lecturer
teaches(L,C)	L teaches course C

express the following in predicate logic.

   a. Logic is taught in term 1.
   b. All term 1 courses are compulsory.
   c. There is a course taught in term 2 which is compulsory.
   d. Term 2 courses either have no prerequisites or have prerequisites that are taught in term 1.
   e. All prerequisites of term 2 courses are taught in term 1.
   f. Every term 1 and term 2 course has a lecturer teaching it.
   g. There is a lecturer who teaches every term 1 and term 2 course.

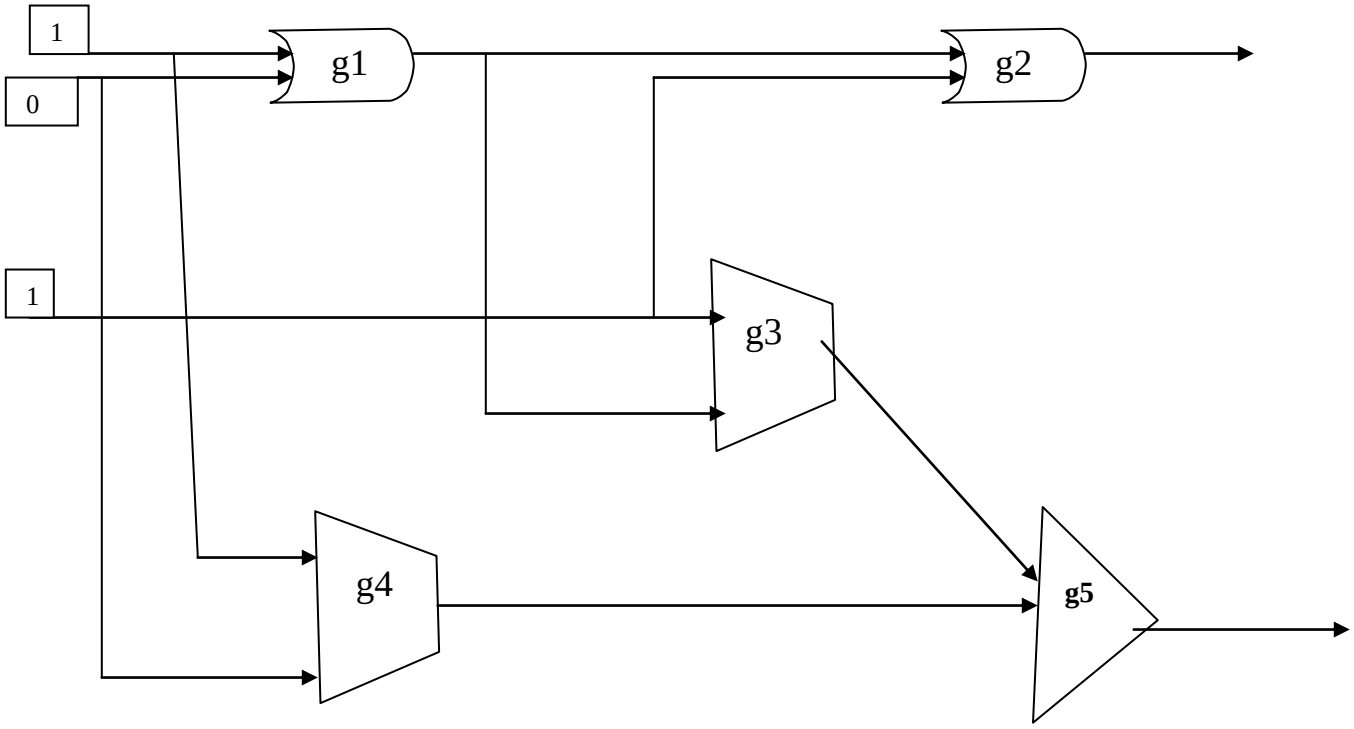
2. Using the predicates:

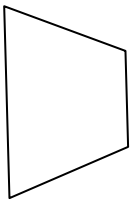
input1(G,I)	input 1 of gate G is I
input2(G,I)	input 2 of gate G is I
output(G,O)	output of gate G is O
andgate(G)	G is an and-gate
orgate(G)	G is an or-gate
xorgate(G)	G is an exclusive-or-gate

and any others you want

formalise in predicate logic, the following configuration of gates and the output of the whole system.

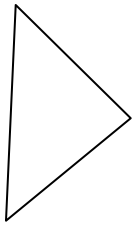
An and-gate produces 1 if both of its inputs are 1, otherwise it produces 0.
An or-gate produces 0 if both of its inputs are 0, otherwise it produces 1.
An exclusive-or-gate produces 1 if its two inputs are different, otherwise it produces 0.





Denotes
And-gate

Denotes
Xor-gate



Denotes
or-gate