Exam for course 4

Surname :
Firstname :
Please report your answers on this page only. Questions are on the following pages.

Question 1 (G-4.1) : Type of games

Question 2 (G-4.2) : Strategies

Question 3 (G-4.3) : Determined games

Question 4 (B-4.1) : Arenas

Question 5 (B-4.2) : Winning conditions

Question 6 (B-4.3) : Playout tree

[Green] Question 1 : Type of games

Indicate which of the following game is an example of a sequential game with imperfect information :

1. Poker
2. Game of Go
3. Rock-Paper-Scissors
4. Starcraft

[Green] Question 2 : Strategies

Report the numbers corresponding to propositions that are true :

1. There is only a finite number of strategies
2. Strategies are functions from arenas to edges
3. Given (non-random) strategies for each player the playout is entirely known
4. At each time a player has to take a decision, he/she must change his/her strategy

[Green] Question 3 : Determined games

Report the numbers corresponding to determined games :

1. In a determined game, each player can only play one strategy
2. In a determined game, for each starting position either Eve or Adam admits a winning strategy
3. All games falling in the scope of the course are determined
4. A game is a tuple containing an arena, a set of final states and a winning condition

[Blue] Question 4 : Arenas

Report the numbers corresponding to propositions that are suitable to arenas in the context of combinatorial game theory :

1. It is an enclosed area often of circular shape
2. It is necessarily a bipartite graph
3. It is a graph whose vertices are split into two disjoint subsets
4. It is a graph such that each vertex contains at least one outgoing edge

[Blue] Question 5 : Winning conditions

Consider a playout λ. What is the name of the winning condition which description is : "λ goes through final states infinitely often" ?

[Blue] Question 6 : Playout tree

Draw the playout tree of the sticks game : we start with 5 sticks. Two players play alternatively. Each turn a player removes 1, 2 or 3 sticks (if there are enough sticks). The first player to remove the last stick loses.