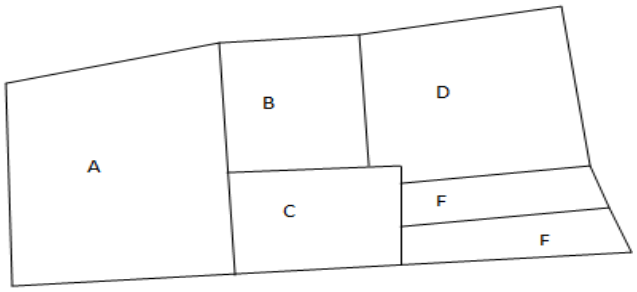
Siliguri Institute of Technology
Department of Information Technology
Second Internal Exam – 2019
Paper Name: Artificial Intelligence Paper Code: IT 605D
Full Marks: 50 Time: 1hour 30 minutes

Answer the following questions:

1. Consider the "**map coloring problems**" where a given map is to be colored in manner so that no neighboring states of a country contain the same color. Give a solution to following map coloring problem viewing it as a Constraint Satisfaction Problem. (10)



2. Consider the following 3-puzzle problem: (5+5+5)

Start state

2	3
1	

Goal State

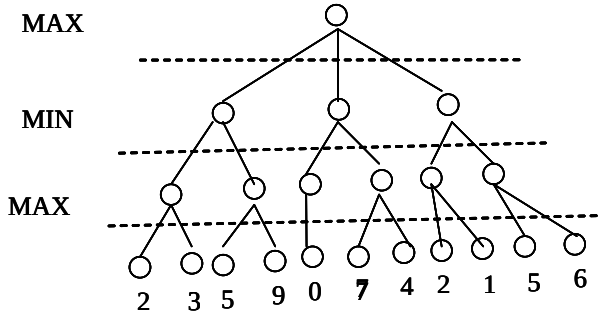
1	2
	3

Possible operators (in order) are up, down, left and Right. Assume that repeated states are not detected. **Label each visited node with a number indicating the order in which they are visited**.

a) Draw the search tree using BFS.
b) Would DFS find the goal? Explain it.
c) A* search with the heuristic being the sum of number of moves and the number of misplaced tiles.

3.

a) Consider the following game tree. (5+10)



i) Using MINIMAX procedure, determine what moves should be chosen by the maximizer in his first turn.

ii) Execute Alpha-Beta pruning on the above game tree. How many terminal nodes are examined? For each cutoff specify whether it is an Alpha-cutoff or Beta-cutoff.

4.

a) Show that "It will rain", using resolution principle.

Given: "If it is hot then it is humid. If it is humid then it will rain. It is hot." (5)

b) Convert the following sentences into first order predicate logic: (1x5)

i) Everyone loves Ram.

ii) Not everyone loves Ravana.

iii) Some people did not come for all meetings.

iv) Not everyone came for all meetings.

v) Only one person spoke at the meeting.