



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: BCS 3843
COURSE	: ARTIFICIAL INTELLIGENCE
SEMESTER/ SESSION	: 1-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO
THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) Define the following terms:
- i. Artificial Intelligence (2 marks)
 - ii. Intelligent Agent (2 marks)
 - iii. Turing Test (2 marks)
- b) Give **FOUR (4)** types of Intelligent Agent. (4 marks)
- c) Based on your answers in Q1(b), discuss the role for each type. (8 marks)
- d) Provide an appropriate diagram to illustrate Turing Test and describe how the test is performed to a machine. (7 marks)

QUESTION 2

Perform Greedy Search technique to find shortest path for the problem in Figure 1 where the starting city is S and the ending city is G. You need to draw the tree to show the shortest path for the problem. (10 marks)

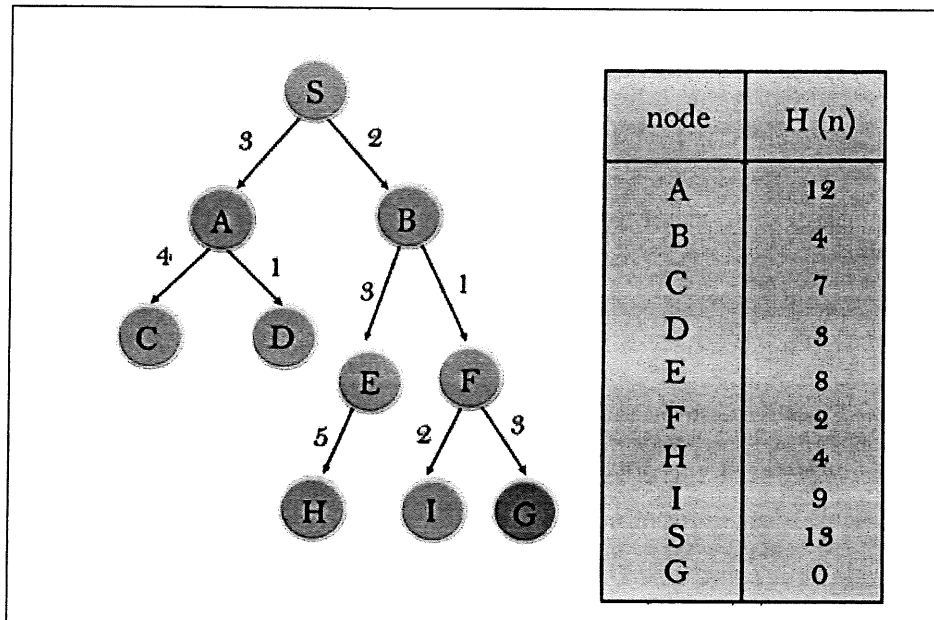


Figure 1

QUESTION 3

Given the following start state and goal state of a puzzle. Complete the solution perform by A* Search Algorithm in Figure 2 to solve the puzzle problem.

(20 marks)

1	2	3
	4	6
7	5	8

Start State

1	2	3
4	5	6
7	8	

Goal State

Tips for solving the puzzle:

The empty space can only move in four directions; Up, Down, Right or Left

The empty space cannot move crossways and can take only one step at a time

By using A * Search, the searching is based on $f(n) = g(n) + h(n)$

where $h(n)$ is the number of misplaced tiles by comparing the current state and the goal state and $g(n)$ is the number of nodes traversed from the start node to current node.

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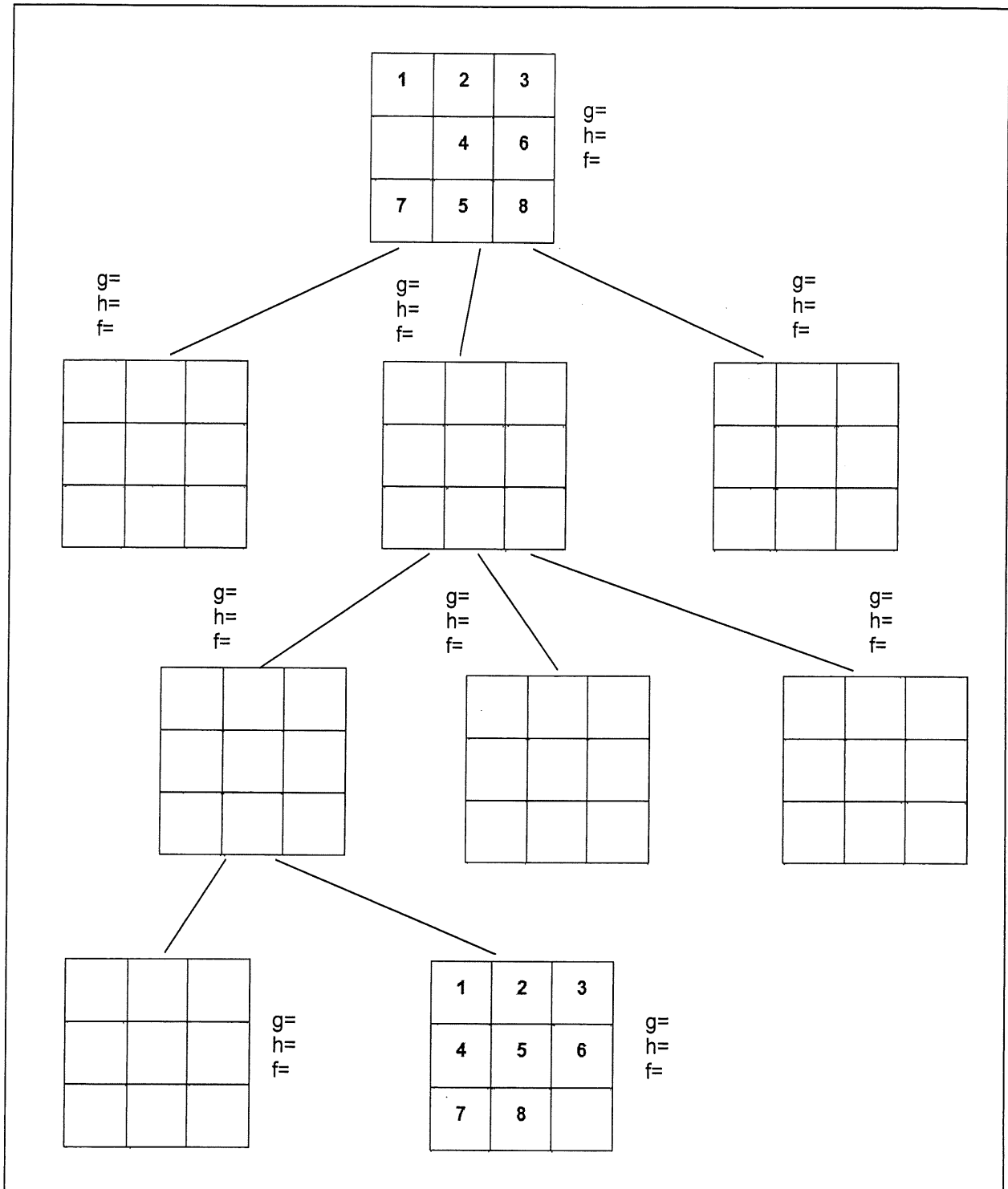


Figure 2

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QUESTION 4

a) Complete the following truth table:

i.

p	q	$p \wedge q$
T	T	
T	F	
F	T	
F	F	

(4 marks)

ii.

p	q	r	$p \vee q$	$(p \vee q) \wedge r$
T	T	T		
T	T	F		
T	F	T		
T	F	F		
F	T	T		
F	T	F		
F	F	T		
F	F	F		

(16 marks)

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QUESTION 5

Provide a decision tree from the given dataset in Table 1 to predict whether shopping is the best decision to do on the day. (25 marks)

Table 1

Day	Outlook	Temperature	Humidity	Wind	Go Shopping?
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

-----End of question-----

