



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH – SEMESTER – VII, IT
SUBJECT: (IT 714) KNOWLEDGE SYSTEMS

Examination : First Sessional
Date : 05/08/2016
Time : 1.15 To 2.30 PM

Seat No. :
Day : Friday
Max. Marks : 36

INSTRUCTIONS:

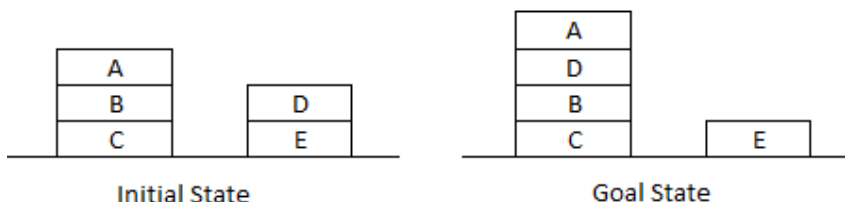
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

- (a) Explain 'local minima' with example. [2]
- (b) Explain the condition in which we guarantee optimality of Breadth First Search. [2]
- (c) Explain ignorable and recoverable problems using example. [2]
- (d) "The heuristic function must always underestimate to make A* optimal". True or False? Justify. [2]
- (e) How does generate and test work? [2]
- (f) "A-star algorithm is better than Best first search algorithm in terms of completeness". Justify the sentence. [2]

Q.2 Attempt **Any Two from the following questions.**

- (a) Apply steepest Ascent Hill climbing algorithm to solve given block world problem. [6]
Assume suitable heuristic function so that your algorithm terminates with success.
Clearly list value for each state.



- (b) Compare work, space complexity, time complexity, completeness and optimality of Depth first search, Iterative deepening DFS and Limited DFS in detail with suitable example. [6]
- (c) Rahul and Reena ia a married couple. They have two children, Raj and Riya. Raj is husband of Rekha. Riya is wife of Rohan. Krish is a son of Raj and Krisha is Daughter of Riya. [6]
Write a prolog code with predicates; parent, male, female to represent above knowledge. Design rules to find cousin, brother, sister, aunt, and uncle.

Q.3 Attempt **ALL from the following questions.**

- (a) You are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has unlimited water which you can use to fill the jug, and the ground on which water may be poured. Neither jug has any measuring markings on it. How can you get exactly 2 gallons of water in the 4-gallon jug? Explain production system using given problem. [6]
- (b) Apply best first search to solve given eight tile puzzle problem. Assume suitable heuristic to solve it. (do not calculate blank tile) [6]

2	8	3
1	6	4
7		5

Initial State

1	2	3
8		4
7	6	5

Goal State

OR

Q.3 Attempt **ALL** from the following questions.

- (a) Apply A* algorithm to find minimum cost to reach goal state on a graph given in Fig 1. [6]
Clearly Show Open and closed nodes. Heuristic values for each node is given below in the table. S is a start node and G is goal node.

h(s)	h(A)	h(B)	h(C)	h(D)	h(G)
20	4	5	3	12	0

- (b) For given prolog code write output for following queries. [2]
1. go(y) 2. go

domains

name = symbol

predicates

go(name)

go

clauses

go(y):-write("Hello"),fail,write("DDIT").

go(y):-fail.

go:-write("Hello").

go:-fail.

- (c) Assume that you are given list of 5 students with their name and branch. 3 of them are in IT, 2 in CE. Write a prolog code to find list of IT students and list of CE students using FAIL. [4]

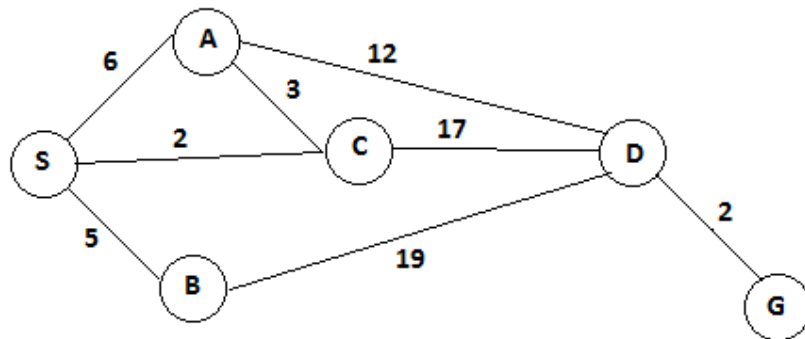


Figure-1