

( 4 )

NR-3  
MCA-31

1	2	3
4	5	6
	7	8

Initial State

1	2	3
4	5	6
7	8	

Final State

(b) What is Knowledge and Metaknowledge ?  
Explain different types of knowledge representation Techniques. 5

8. Write short notes on any two of the following : 5 x 2

(a) Limitations of Expert system

(b) Self-explanation system

(c) A\* algorithm

(d) Context Free Language.

COGNITIVE

7,0

7 4

3,4

0,3

Total Pages - 4

MCA / 5th  
Artifi Intelli

Full Marks : 70

Time : 3 hours

Answer any six questions including Q.No.1 which is compulsory.

The figures in the right-hand margin indicate marks

1. Answer all the following questions : 2 x 10

(a) What is a Knowledge based system ? Explain with example.

(b) Define State Space Search technique and its application.

(c) Define and differentiate Predicate and Propositional logic.

(d) Define constraint satisfaction problem ? Write an example.

(e) What are knowledge based agents ? How they are useful ?

(f) Explain what is AI ? Write various areas of AI.

( 2 )

(g) What do you mean by pattern recognition ?  
Mention its significance.

(h) Differentiate between Heuristics and  
Algorithm with an example for each.

(i) What is the application of A\* algorithm ?  
Write the heuristic function used for this  
algorithm.

(j) Discuss the basic elements of Natural  
Language Processing with suitable block  
diagram.

2. (a) Is the following WFF's (well-formed  
formula's) valid ? Justify your answer with a  
truth table.

$$[(P \vee Q) \wedge (Q \vee R)] \Rightarrow (P \vee R) \quad 5$$

(b) What do you understand by 'Parsing' ? Draw a  
Parse Tree and define the Grammar : A Boy  
ate an Apple. 5

3. (a) What are different types of AI system ? What  
is its significance in AI ? 5

(b) Define Expert System Architecture and write  
down its Properties. 5

( 3 )

4. (a) Discuss the Fundamentals of 'Water jug  
Problem' ? How Heuristic search helps to  
solve it ? 5

(b) Give the Initial state(I), Goal test(G),  
Successor function(S) and Cost function(C)  
for the following Problem :

"Two water jugs, one 7 litre and another 4 litre,  
with no measuring marks on them. There is a  
pump with continuous flow of water. How  
exactly 2 litre of water can be stored in a 7-  
litre jug ? 5

5. (a) Explain the AO\* algorithm with an example. 5

(b) State when will Hill climbing search technique  
fail ? Do the Steepest Hill climbing always find  
solutions ? How might some problem be  
overcome in search ? 5

6. (a) Explain different types of Chomsky's  
hierarchy grammars. 5

(b) Differentiate between Deterministic and  
Non-Deterministic Parsers with examples. 5

7. (a) State and explain 8-puzzle problem. Solve  
following 8 - puzzle problem using heuristic  
search. 5