DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VII [IT]
SUBJECT: (IT714) KNOWLEDGE SYSTEMS

Examination	**: First Sessional**	**Seat No.**	**: _____**
Date	**: 03/08/2018**	**Day**	**: Friday**
Time	**: 2:30 to 3:45**	**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) How will we know if we have succeeded to build an AI? **[2]**

(b) What is use of fail predicate in prolog? **[2]**

(c) i. For which from the following solution steps can be ignored or undone? **[1]**

ii. Which from the following are decomposable problems? **[1]**

A. Chess **B**. 8- puzzle **C**. Missionaries and cannibals **D**. Water jug

(d) In which case Iterative deepening DFS always guaranties to give optimal solution? **[2]**

(e) Explain Anaphoric ambiguity with example. **[2]**

(f) What is 'overfitting' in machine learning? How to get rid of it? **[2]**

Q.2 Attempt ***Any Two*** from the following questions. **[12]**

(a) What are the components of NLP? Explain phases of it in brief. **[6]**

(b) What does production system consists of? Write short note on four categories of it. Write their examples. **[6]**

(c) Define heuristic function for given block-word problem and apply any version of Hill climbing algorithm to get solution. **[6]**

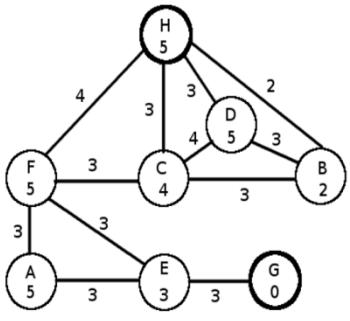
A
F
E
D
C
B

Initial

F
E
D
C
B
A

Goal

Q.3 (a) Apply Best First search and A-star algorithm to find solution paths for given graph, where **H** is the start node and **G** is the goal node. Actual cost is given on the edges and heuristic values are inside the circle. **[6]**



(b) Apply chronological backtracking on given crptarithmatic problem and find answer which satisfies all constraints. **[6]**

E A G E R
\+ M A T H
_____
T R E A T

OR

Q.3 (a) On one bank of a river are three missionaries and three cannibals. There is one boat available that can hold up to two people and those they would like to use to cross the river. If the cannibals ever outnumber the missionaries on either of the river's banks, the missionaries will get eaten. **[6]**

How can the boat be used to safely carry all the missionaries and cannibals across the river using any of the blind search techniques?

(b) Write a prolog code which accepts department, designation, name, age, basic salary, house rent allowance (HRA) of an employee and compute dearness allowance (DA) which is 15% of basic salary. Also add a logic which determines the gross salary (basic salary+HRA+DA) of the employee. Display all information of the employee. (Use variables, rules, I/O predicates, arithmetic operators as per needed). **[6]**