CLASS: BE   SEMESTER : V
BRANCH: CSE   SESSION : MO/18

SUBJECT: CS8101 ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
TIME: 3 HOURS   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	What is an artificial intelligence? Mention the importance of AI in present context.	[2]
Q.1(b)	Explain the Procedural, declarative and heuristic knowledge. Give examples.	[4]
Q.1(c)	Why knowledge acquisition and representation are crucial for knowledge-based system?	[6]
Q.2(a)	Write the LISP function for the mathematical expression: (a*b/c)+d-c.	[2]
Q.2(b)	Write a LISP program to covert centigrade temperature to Fahrenheit.	[4]
Q.2(c)	Write a function called club-member which take one list as argument. The function should print the prompt to the user (please type any word). If word typed is a member of the list the function should return t otherwise reverse the list. E.g > (club-member '(tom dick harry)).	[6]
Q.3(a)	What is the difference between PL and FOPL?	[2]
Q.3(b)	What is wff? State the procedure of conversion from wff to clausal form. Use suitable example.	[4]
Q.3(c)	Consider the following sentences:	[6]

- Jack owns a dog.
- Every dog owner is an animal lover.
- No animal lover kills an animal.
- Either Jack or Curiosity killed the cat, who is named Tuna.
- Did Curiosity kill the cat?
    I.   Convert the above sentences into FOPL. If required use addition background knowledge.
    II. Prove through resolution that curiosity killed Tuna.

Q.4(a)	What is nonmonotonic reasoning?	[2]
Q.4(b)	Explain the truth maintenance system with diagram.	[4]
Q.4(c)	Explain Dempster-Shafer theory using the belief function of your choice.	[6]
Q.5(a)	Draw the conceptual graph for "Mary gave John the book".	[2]
Q.5(b)	What is conceptual Dependency (CD)? Draw CD for "John prevented Mary from giving a book to Bill".	[4]
Q.5(c)	State the five-ontology used in conceptual dependencies theory with example. Developed the script for buying a shirt from supper market.	[6]
Q.6(a)	What is sets and bags matching?	[2]
Q.6(b)	How best-first search combines the advantage of both breath-first search and depth-first search into a single method? Explain with example.	[4]
Q.6(c)	Analyze the 8-puzzle problem given below. Consider solving it using hill climbing algorithm. Find heuristic function that work on the following example.	[6]

Start

1	2	3
8	5	6
4	7	

Goal

1	2	3
4	5	6
7	8	

Q.7(a)	List the three functional components of backboard system.	[2]
Q.7(b)	What are the characteristics of an expert system?	[4]
Q.7(c)	To develop a medical expert system, what are the factors which have to be taken into account? Analyze the problem in detail.	[6]