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**BCACAC 305**

**Credit Based Fifth Semester B.C.A. Degree Examination,  
October/November 2013  
(Common to all Batches)  
ARTIFICIAL INTELLIGENCE**

Time : 3 Hours

Max. Marks : 100

**Note :** Answer **any ten** questions form Part – A and **one full** question from **each** Unit in Part – B.

**PART – A**

**(10×2=20)**

1. a) What is an AI ?
- b) Define the terms heuristic and heuristic function.
- c) Define travelling salesman problem.
- d) What is the difference between OR-graph and AND-OR graph ?
- e) Define declarative knowledge with example.
- f) What do you mean by inferential adequacy ?
- g) What do you mean by computable predicates ? Give one example.
- h) What is syntactic analysis ?
- i) What is classification ?
- j) What is rote learning ?
- k) Write a LISP program to find the factorial of a number using recursion ?
- l) How do you declare facts in PROLOG ? Explain with an example.

**PART – B**

**UNIT – I**

2. a) Define monotonic, nonmonotonic, partially commutative and commutative production system with example.
- b) Write depth first search algorithm.
- c) Write Steepest ascent hill climbing algorithm. What are the problems that may arise in this method ? Explain. **(8+4+8)**



3. a) Give various production rules that can be used for solving the water jug problem of filling exactly 2 gallon of water into 4-gallon jug by providing a 3 gallon, 4-gallon jugs and a pump. Describe a solution to this problem by applying this sequence of rules.
- b) Write problem-reduction algorithm. (15+5)

UNIT – II

4. a) Write the algorithm for property inheritance.
- b) With suitable example, explain the usage of isa and instance predicates in the representation of facts.
- c) Explain inferential knowledge with example. (5+10+5)
5. a) Mention the properties should be possessed by a good knowledge representation system.
- b) How do you represent facts for the following set of sentences, using predicate logic ? And answer the question : "is Marcus alive?"
- i) Marcus was a man.
  - ii) Marcus was a Pompeian.
  - iii) Marcus was born in 40 A.D.
  - iv) All men are mortal.
  - v) All Pompeians died when volcano erupted in 79 A.D.
  - vi) No mortal lives longer than 150 years.
  - vii) It is now 2013.
  - viii) Alive means not dead
  - ix) If someone dies, then he is dead for all the later times.
- c) Write a note on procedural knowledge with example. (4+12+4)

UNIT – III

6. a) Differentiate top down parsing with bottom up parsing.
- b) Explain case grammars with example.
- c) Which are the inputs accepted by explanation based learning ?
- d) What is the goal of version space ? Write candidate elimination algorithm. (4+5+4+7)
7. a) With an example, explain ATN.
- b) Write a note on semantic grammar.
- c) Explain learning with macro operator. (10+5+5)



UNIT – IV

8. a) Explain the characteristic features of expert systems.  
b) Explain any six predicate functions of LISP with suitable example.  
c) How can you construct local variables in LISP ? Explain with example.  
d) Write a LISP function to find maximum of 3 numbers. (5+6+5+4)
9. a) Explain any six list manipulation functions in LISP with example.  
b) How to work with arrays and property lists in LISP ?  
c) Explain conditional statements and logical functions used in LISP with an example.  
d) Give the internal storage linked cons-cell structure for the list ((xy) (z(uv))). (6+5+5+4)
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