CSE02

RAMAIAH
Institute of Technology

(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A' Grade

SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2019

Course & Branch	:	B.E. : Computer Science and Engineering	Semester	: V
Subject	:	Artificial Intelligence	Max. Marks :	100
Subject Code	:	CSE02	Duration	: 3 Hrs

Instructions to the Candidates:
- Answer one full question from each unit.
- Use suitable examples and diagrams wherever necessary to support your answers.

UNIT – I

1. a) Define in your own words the following terms: artificial intelligence and rationality. — CO1 (04)

   b) Write the algorithm for Depth Limited Search and briefly explain the same with an example. — CO1 (06)

   c) Define PEAS as applied to agents. Develop PEAS description of an agent that reports threat of tsunami activity. Determine what type of agent architecture is most appropriate (table lookup, simple Reflex, goal-based, or utility-based). Give a detailed explanation and justification of your choice. — CO1 (10)

2. a) Write and explain the Heuristic search Algorithm. Apply the algorithm on the following 8 puzzle problem to reach the goal state from the given initial state. — CO1 (10)

   Initial State   **Goal State**
   2 8 3   1 2 3
   1 6 4   8 # 4
   7 # 5   7 6 5
   Also comment on the parameters which contribute to the Performance of Heuristic search algorithms.

   b) Draw the block diagram of a learning agent and explain its components. State one real time example where the learning agent would correctly fit in. — CO1 (10)

UNIT – II

3. a) Define the following terms as applied to predicate logic. Use suitable examples: — CO2 (08)
   - Atomic sentences
   - Well-formed Formulae
   - Quantifiers
   - Connection between the existential and universal quantifiers.

   b) Represent the following sentences in first-order logic, using a consistent vocabulary: — CO2 (12)
   i) Politicians can fool some of the people all of the time, and they can fool all of the people some of the time, but they can't fool all of the people all of the time.
   ii) If a person cannot receive an idea then he cannot use that idea.
   iii) All people living in houses that have been built in 2010 or built in 2011 have been taxed.

4. a) Given the statements: "Anyone passing his history exams and winning the lottery is happy. Anyone who studies or is lucky can pass all his exams. John did not study but he is lucky. Anyone who is lucky wins the lottery. Prove by resolution process the statement "John is happy".   CO2   (12)

   b) Obtain a passport application for your country, identify the rules determining eligibility for a passport, and translate them using knowledge Engineering in First Order Logic.   CO2   (08)

UNIT – III

5. a) Write the GRAPGPLAN Algorithm and explain how it works.   CO3   (08)

   b) List any three learning methods and explain those using suitable examples.   CO3   (12)

6. a) For the case study of Toothache, cavity, Catch world, explain the concept of Inference using full joint Distribution.   CO3   (10)

   b) Justify how learning decision trees aid to be one of the good inductive learning methods. Elaborate on the concepts of performance elements and expressiveness of decision trees using suitable example.   CO3   (10)

UNIT – IV

7. a) Define the Information Retrieval process. Explain how the PageRank and HITS algorithms can be applied for the same.   CO4   (12)

   b) Using suitable example explain the concepts of "parsing with semantic grammar" and "case grammar" as applied to NLP.   CO4   (08)

8. a) Briefly explain the machine translation process using the Vauquois triangle concept.   CO4   (10)

   b) List the steps in the natural language understanding process and explain the same using suitable examples.   CO4   (10)

UNIT – V

9. a) Explain the Ant's algorithm and list at least two applications of the same.   CO5   (08)

   b) Categorize Robots based on their types, Manipulation, environment and the device it's made of. Give examples for each type.   CO5   (12)

10. a) State the three basic operations of Genetic algorithms and explain how they are applied to handle the problem of the Job-Shop scheduling.   CO5   (12)

    b) Justify how uncertainty is handled in Robot motion.   CO5   (08)

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