# CSE02/CSPE16

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**RAMAIAH**
**Institute of Technology**

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

## MAKEUP EXAMINATIONS – FEBRUARY 2019

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| **Course & Branch** | **:** | **B.E : Computer Science and Engineering** | **Semester** | **:** | **V** |
| **Subject** | **:** | **Artificial Intelligence** | **Max. Marks** | **:** | **100** |
| **Subject Code** | **:** | **CSE02/CSPE16** | **Duration** | **:** | **3 Hrs** |

**Instructions to the Candidates:**

- Answer one full question from each unit.
- Use suitable examples and diagrams wherever necessary to support your answer.

**UNIT- I**

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| 1. | a) | Summarize any four common benefits of Artificial Intelligence technology. Also list any four most powerful AI companies and briefly discuss their contribution to the world. | CO1 | (10) |
| | b) | Define Heuristic search technique. Apply the heuristics technique to solve the 8 puzzle problem and explain the same. Also comment on the performance of the heuristic techniques. | CO1 | (10) |
| 2. | a) | Write the algorithms of Iterative Deeping search and Depth Limited Search. Compare their performance based on the parameters of completeness, time, space and optimality. | CO1 | (08) |
| | b) | Explain how the online search problems can be solved using the concept of learning in online search. | CO1 | (08) |
| | c) | Draw the block diagram of the model-based, utility based agent. | CO1 | (04) |

**UNIT– II**

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| 3. | a) | Explain the resolution process for propositional logic and give the Algorithm. | CO2 | (10) |
| | b) | Represent the following statements using First – Order Logic and convert each to CNF<br>i) There are no mushrooms that are poisonous and purple<br>ii) Everyone who loves all animals is loved by someone. | CO2 | (10) |
| 4. | a) | Explain the steps involved in conversation of First –Order Logic to CNF . | CO2 | (10) |
| | b) | Let knowledgebase( KB ) be( (P **V** Q)=>R; (¬P=> ¬R); Q) which corresponds to the three facts we know about the new currency in India:<br>i)If it is new 500 currency note or new 2000 currency note, then I can shop.<br>ii) If it is old 500 currency note, then I cannot shop.<br>iii)I have a new 2000 currency note.<br>Let the query R be " Can I shop?" .<br>Using truth table approach show the query R is entailed by the knowledgebase KB and the sentence KB=> R is valid. | CO2 | (10) |

## UNIT- III

5. a) Briefly explain how you draw inference using full joint distribution focusing on the rules of conditioning and marginalization. CO3 (10)
Given the full joint distribution for the toothache, cavity and catch world:

| | toothache | | ¬ toothache | |
|---|---|---|---|---|
| | catch | ¬catch | catch | ¬catch |
| cavity | 0.108 | 0.012 | 0.072 | 0.008 |
| ¬cavity | 0.016 | 0.064 | 0.144 | 0.576 |

Calculate the following:
i) P(toothache)
ii) P(cavity)
iii) P(toothache | cavity)
iv) P (cavity | toothache V catch).

b) Formulate the PDDL description of an air cargo transportation planning problem. CO3 (04)

c) List any two important benefits of decision tree learning algorithm. Draw a decision tree for the problem of deciding whether to move forward at a road intersection, given that the light has just turned green. CO3 (06)

6. a) Compare the working mechanism and the performance of progression and regression planning techniques. Use the any example to explain your answer. CO3 (10)

b) Justify the statement: "The support vector machine or SVM framework is currently the most popular approach for "off-the-shelf" supervised learning ". Support your answer using any case study. CO3 (10)

## UNIT- IV

7. a) List any four information extraction techniques in NLP and elaborate on the probabilistic model for sequences with hidden state. CO4 (10)

b) What do you understand by semantic interpretation in Natural language communication? Write the grammar for arithmetic expressions, augmented with semantics and draw the parse tree with semantic interpretations for the string "3 + (4 ÷ 2)". CO4 (10)

8. a) Discuss how the process of text classification is handled in NLP. CO4 (10)
How do you classify an email as a spam or not-spam (Ham), explain with an example.

b) What are machine translation systems? Discuss the application of the same in the present day scenario. CO4 (05)

c) Define information retrieval process in NLP. How are information retrieval systems characterized? CO4 (05)

## UNIT- V

9. a) Describe the different types of crossover process in genetic algorithm with an example. CO5 (10)

b) Describe two main approaches that are involved in path planning for robot movement. CO5 (10)

10. a) What are the basic genetic operators and their significance? CO5 (10)

b) With an example, explain ANTS algorithm in detail. CO5 (10)

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