



## SEMESTER END EXAMINATIONS – JANUARY 2020

Program	: B.E. : Computer Science and Engineering	Semester	: V
Course Name	: Artificial Intelligence	Max. Marks	: 100
Course 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

- Define Artificial Intelligence. Summarize any five common benefits of Artificial Intelligence technology. List out any five real-time applications of AI. CO1 (10)
  - Explain A\* search algorithm with an example. CO1 (10)
- Describe Heuristic search technique. Apply the heuristics technique to solve the 8-puzzle problem and explain the same. Also discuss the performance of the heuristic techniques. CO1 (12)
  - Explain how the online search problems can be solved using the concept of learning in online search. CO1 (08)

### UNIT- II

- Solve the below query using resolution method:  
"All people who are not poor and are smart are happy. Those people who read are smart. John can read and is not poor. Happy people have exciting lives. Can anyone be found with an exciting life?" CO2 (10)
  - Differentiate between first order and higher order logic. CO2 (05)
  - Define Horn clause. Give examples. CO2 (05)
- Discuss knowledge-based agents. CO2 (05)
  - Convert the following into Predicate Logic: CO2 (05)
    - Someone is teasing.
    - It is not true that all roads lead to Rome.
  - Explain the steps involved in Resolution Refutation proof in detail. Give examples for each step. CO2 (10)

### UNIT- III

- Differentiate between supervised and unsupervised learning methods using suitable examples. CO3 (10)
  - Discuss 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)  $P(\neg \text{toothache})$
- ii)  $P(\neg \text{cavity})$
- iii)  $P(\text{toothache} \mid \text{cavity})$
- iv)  $P(\text{cavity} \mid \text{toothache} \vee \text{catch})$ .

- 6. a) Explain Decision tree algorithm with example. CO3 (12)
- b) Describe the differences and similarities between problem solving and planning. Use suitable example to support your answer. CO3 (08)

## UNIT- IV

- 7. a) What is syntactic analysis (parsing) in NLP. Write the CYK algorithm for parsing and explain it briefly. CO4 (10)
- b) Discuss PageRank algorithm. CO4 (10)
- 8. a) Describe N-gram character and word models with examples. List out any two applications. CO4 (10)
- b) Explain HITS algorithm. CO4 (10)

## UNIT- V

- 9. a) Discuss in detail the subsumption and pipeline robot architectures. CO5 (10)
- b) Elaborate on the application of Genetic Algorithm on optimization problem of Job-Shop scheduling. CO5 (10)
- 10. a) Explain the importance of genetic algorithms in Artificial Intelligence. CO5 (05)
- b) Explain the image formation and earthly image processing operations. CO5 (07)
- c) Formulate any two tasks of computing which would be possibly solved by applying the philosophy of biological ants and explain the same. CO5 (08)

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