

U.G. 6th Semester Examination - 2022**BCA****Course Code : BBCADSHT 4 [DSE-4]****Course Title : Artificial Intelligence**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **ten** questions: $1 \times 10 = 10$
- Define state space search.
 - What do you understand about conflict in AI?
 - Name two heuristic search methods.
 - What are the basic elements of FOPL?
 - What is an agent?
 - What do you mean by fuzzy logic?
 - Name three assumptions in Problem Solving.
 - What is monotonic production system?
 - Why do we need parsing?

- What is binary resolution?
 - What is unsupervised learning?
 - Define Tokenization in Natural Language Processing (NLP).
 - Compare between BFS and DFS.
 - State Modus Ponens.
 - What is mutation in Genetic Algorithm?
2. Answer any **five** questions: $2 \times 5 = 10$
- Mention the major characteristics of supervised learning.
 - Covert the given sentence in FOPL:
Not all students like both Mathematics and Science.
 - What is plateau and local maxima?
 - Write one advantage and one disadvantage of Expert Systems in our daily life.
 - Differentiate between procedural and declarative knowledge.
 - Describe in short knowledge based system.
 - What is strong cut and alpha cut in fuzzy logic?
 - Write about backward chaining with an example.

3. Answer any **two** questions: $5 \times 2 = 10$

- a) Explain AO* algorithm. Under what conditions it can be used? $3+2$
- b) Define ANN. Explain the problem statement for the water jug problem. $3+2$
- c) i) Write the features of LISP programming language.
- ii) Write a LISP program to find the minimum of a list of numbers. $2+3$

4. Answer any **one** question: $10 \times 1 = 10$

- a) Express the following as semantics net with interconnected nodes and labeled arcs:
Company ABC is a software company. Three departments within the company are sales, administration and programming. Raghu is a manager of programming. Avik and Shreya are programmers. Shreya is married to Satish. Satish is an editor of a local newspaper XYZ. They have three children and they live on Renny Road. Shreya wears glasses and is 5.5 feet tall.
- b) i) Write short note on knowledge acquisition.

ii) Discuss the different knowledge representation techniques of AI. $4+6$

c) Define AI. Mention some applications of Natural Language Processing. Derive a parse tree for the sentence *Raju loves the frog*, where the following rules are used:

- $S \rightarrow NP V P$
 - $NP \rightarrow N$
 - $NP \rightarrow DET N$
 - $VP \rightarrow V NP$
 - $DET \rightarrow THE$
 - $V \rightarrow LOVES$
 - $N \rightarrow RAJU|FROG$ $2+2+6$
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