Roll No. [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Total No. of Pages : 02

Total No. of Questions : 07

BCA (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : UGCA-1945

M.Code : 91689

Date of Examination : 02-07-22

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

   a. Define intelligence. What is the intelligent behaviour of a machine? Discuss various levels of artificial intelligence.

   b. Discuss the history of artificial intelligence briefly.

   c. What is Bayesian reasoning? How does an expert system rank potentially true hypotheses? Give an example.

   d. What are a fuzzy set and a Membership function? What is the difference between a crisp set and a fuzzy set? Determine possible fuzzy sets on the universe of discourse for man weights.

   e. Write down the steps of breadth first search. Illustrate with example.

   f. Explain the process of memory bounded heuristic search.

   g. Discuss the advantages of using context-free grammars in design of practical natural language parsers.

   h. Give a heuristic that a block-stacking program might use to solve problems of the form "stack block X on block Y".

   i. What is an expert system shell? What are the fundamental characteristics of an expert system?

   j. What is pattern recognition? Discuss its applications.

SECTION–B

2. What are the different approaches in defining artificial intelligence? What characteristics must a problem possess to be solved using artificial intelligence? Write a description of 8-queens problem.

3. Discuss the syntax and semantics of prepositional logic. List the rules of inference for propositional logic. Consider the following facts and construct a step-by-step proof by resolution of the statement "John likes peanuts".

   a. John likes all kinds of food.

   b. Apple and vegetable are foods.

   c. Anything anyone eats and is not killed by is food.

   d. Anil eats peanuts and is still alive.

   e. Harry eats everything that Anil eats.

4. How are objects related in frame-based systems? What are the 'a-kind-of' and 'a-part-of' relationships? Give examples.

5. Differentiate between informed search and uninformed search. Explain depth first search technique with example. Discuss the performance of this technique.

6. Explain the architecture of an expert system. What are rule based system architecture and non production system architecture?

7. Write about the various tasks in natural language processing in detail. What are the main difficulties in natural language understanding?

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Total No. of Questions : 07

Total No. of Pages : 02

BCA (Sem–6)

ARTIFICIAL INTELLIGENCE

Subject Code : UGCA1945

M.Code : 91689

Date of Examination : 22-05-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

   a) What is knowledge acquisition?

   b) What is a heuristic function?

   c) How forward reasoning is different from backward reasoning?

   d) What is the complexity of a problem?

   e) What is a propositional logic?

   f) Explain the hill climbing technique for search.

   g) What is the basic principle of resolution?

   h) What is AI?

   i) Mention one application area of AI where uncertainties are present.

   j) What is an optimal search?

SECTION-B

2. Describe in detail the differences between language understanding and language generation.

3. Under what conditions would it make sense to use both forward and backward chaining? Give an example where both are used.

4. What is state space search? How water jug problem is represented in it?

5. What is an inference engine in an expert system? What are the various functions of an inference engine?

6. **Express the following things in predicate calculus :**

   a) all p's are q's

   b) Some p's are q's

   c) John hit everyone who was near him

   d) Nobody does anything without a reason.

7. Develop a parse tree for the sentence "Jack slept on the table" using the following rules

   S → NP VP

   NP → N

   NP → DET N

   VP → V PP

   PP → PREP NP

   N → jack | table

   V → slept

   DET → the

   PREP → on

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BCA (Sem–6)

ARTIFICIAL INTELLIGENCE

Subject Code : UGCA1945

M.Code : 91689

Date of Examination : 10-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. Write briefly :

a) What is the intelligent agent in AI, and where are they used?

b) What are some misconceptions about AI?

c) Define definite clauses.

d) What is certainty fact?

e) What do you mean by uncertain knowledge?

f) List down the issues in knowledge representation.

g) What is heuristic function?

h) Write down the steps of search plan.

i) Is pattern recognition and classification the same?

j) What are the advantages of expert system in AI?

SECTION-B

2. What are the characteristics of Artificial Intelligence? Discuss with the help of "water jug" problem.

3. What is problem space? How problem can be defined? Explain.

4. What are belief networks? Write down the applications of belief networks.

5. Explain the key features of informed search algorithms in Artificial Intelligence.

6. Explain Knowledge acquisition and validation.

7. What is classification? Discuss syntactic classification.

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BCA (Sem–6)

ARTIFICIAL INTELLIGENCE

Subject Code : UGCA-1945

M.Code : 91689

Date of Examination : 26-05-2025

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Answer briefly :**

   a) What is the Water Jug problem and how is it formulated in AI?

   b) Define First order logic and give one example of its use in AI inference.

   c) What are Fuzzy sets? Provide one example.

   d) What is an Associative Network in knowledge representation?

   e) What is the main advantage of Iterative Deepening Depth-First Search?

   f) Write a short note on Bidirectional search.

   g) What is the role of Grammar in NLP?

   h) Write a short note on Decision Theoretic Classification.

   i) Differentiate between Syntactic Classification and Learning Classification Patterns

   j) Define Proof by Resolution in Propositional Logic.

SECTION-B

2. Define Horn clauses and Definite clauses. Explain the mechanism of Forward Chaining and Backward Chaining for inference with the help of an example.

3. What are Belief Networks? Discuss their structure, working, and applications in AI.

4. Differentiate between Breadth-First Search and Depth-First Search with the help of an example.

5. Describe the Hill Climbing algorithm including its limitations. Explain how Simulated Annealing attempts to overcome these limitations.

6. Describe the architecture of expert systems with examples. Differentiate between rule-based and nonproduction architectures.

7. What is speech recognition? Explain the process of recognizing" and understanding speech patterns.

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