

33

June - 2016

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2066)

16116(J)

B. Tech 6th Semester Examination

Artificial Intelligence (NS)

CS-324/IT-323

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all by selecting one question from each of the section A, B, C and D and all the sub-parts of section E.

SECTION - A

1. (a) Write algorithm for Hill Climbing Search. Discuss the problem of local maximum and ridge in Hill Climbing Search procedure. (10)
- (b) Discuss the technique of Means-End Analysis. What can be the problems in applying this algorithm? (10)
2. (a) What is Predicate Logic? With suitable examples, explain the steps needed to convert a WFF in predicate logic to its equivalent clause form. (10)
- (b) Compare Forward reasoning Vs Backward reasoning. (10)

SECTION - B

3. (a) What are the most commonly used Lisp functions? (10)
- (b) What is an anonymous variable in PROLOG? Discuss the scope of an anonymous variable. (10)

[P. T.O.]

2

16116

4. (a) Define artificial neural network. What is meant by multilayer ANN? (10)
- (b) Discuss a few tasks that can be performed by a back propagation network. (10)

SECTION - C

5. Name and describe the main features and working of Genetic Algorithms (GA). (20)
6. What is the purpose of expert system MYCIN? Explain how uncertainty is propagated through a chain of rules during a consultation with an expert system which is based on the MYCIN architecture. (20)

SECTION - D

7. (a) What do you understand by SWARM Intelligence? What is the basic idea behind the notion of SWARM Intelligence? (10)
- (b) Explain and discuss Ant Colony system and its working. (10)
8. (a) Given the grammar and lexicon below, show the final chart for the following sentence after applying the bottom-up chart parser. Remember that the final chart contains all edges added during the parsing process.

S → VP
 VP → Verb NP
 NP → NP PP
 NP → Det Noun
 PP → Prep Noun

Det → the
 Verb → Find
 Prep → in
 Noun → men | suits

"Find the men in suits"

(10)

- (b) What is ELIZA? Write a short note on ELIZA along with necessary illustrations. (10)

SECTION - E

9. (a) Differentiate between Heuristic and Brute Force search.
- (b) What is the difference between Procedural knowledge and Declarative knowledge?
- (c) Explain rules of Inference.
- (d) Describe the type of programming problems for which LISP is well suited.
- (e) Differentiate Cut predicate and Fail predicate in PROLOG.
- (f) What is Boltzman machine?
- (g) Write short note on Genetic operators.
- (h) What should be the characteristics of an expert system?
- (i) What is PSO algorithm?
- (j) What is difference between top down and bottom up parsing? (10×2=20)

J-FB-22-00307**B. Tech. EXAMINATION, 2022**

Semester V (CBCS)

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

(CSE, IT)

CS-504

*Time : 3 Hours**Maximum Marks : 60*

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. (a) Explain the A* algorithm in detail. 5
- (b) Describe Minmax algorithm in game theory. 5

2. Explain Breadth, Depth and Best first search with examples. 10

Section B

3. (a) What do you mean by knowledge representation? Describe types of knowledge. 5
(b) Write down Key differences between forward and backward reasoning. 5
4. (a) Explain Converting English to PROLOG facts and rules. 5
(b) Describe Conjunctive normal form and Disjunctive normal form. 5

Section C

5. (a) Explain Genetic operators. 5
(b) Explain Back-propagation learning. 5
6. (a) Explain Hopfield network. 5
(b) Describe problems with genetic algorithms. 5

Section D

7. (a) What is Expert system? Explain characteristics of expert system. 5

- (b) Explain some Knowledge representation languages. 5

8. (a) Differentiate top-down and bottom-up parsing. 5
(b) Define the terms Knowledge engineering and inferencing. 5

(Compulsory Question)

9. Write short notes on the following : 2×10=20
- (a) Intelligent agents
 - (b) Hill climbing
 - (c) AND/OR graph
 - (d) Knowledge
 - (e) Well-formed formula
 - (f) PROLOG
 - (g) Genetic algorithm
 - (h) Natural Language
 - (i) Backward chaining
 - (j) Forward chaining.

17150(M)

B. Tech 6th Semester Examination
Artificial Intelligence (NS)

CS-324/IT-323

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from each of the sections A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) How would you define a problem as state space search? Discuss with the help of an example. (10)
- (b) What are the necessary conditions associated with best first search method? Also explain best first search method with example. (10)

2. (a) With the help of example, explain the different issues in knowledge representation. (10)

- (b) What is predicate logic? Convert the following in clausal form:
$$A(x) \rightarrow [P(x) \wedge \sim Q(x,m)] \rightarrow [R(x,n) \vee (\forall y : \exists z : R(y,z) \rightarrow T(x,y))]$$
 (10)

SECTION - B

3. (a) Write a program in LISP to compute the factorial of 'n' using recursion. (10)
- (b) Describe the statements that control the program flow in PROLOG. (10)

4. (a) Describe the reasons of specifying prolog functions and predicates recursively. (10)

- (b) Describe the role of each component of a general learning model. Write the applications of Hopfield neural networks. (10)

SECTION - C

5. (a) What is a genetic algorithm? Briefly explain the components of genetic algorithm. (10)
- (b) Discuss the requirements that a problem should satisfy in order to be suitable for solving it by a genetic algorithm. (10)

6. (a) What are the advantages and disadvantages of use of meta knowledge in expert system inference? (10)
- (b) Describe the tools available to acquire knowledge and to update knowledge automatically in expert system. (10)

SECTION - D

7. (a) Explain the development and applications of ANT colony system. (10)
- (b) Discuss in detail the particle swarm optimization algorithm. (10)

8. (a) Define syntax, semantics and pragmatics. State the relation among them. Also differentiate between syntax & semantics and semantics & pragmatics. (10)
- (b) How is lexicography related to natural language processing? Explain with example. (10)

[Total No. of Questions - 9] [Total No. of Printed Pages - 2]

MAY-24-0471

CS-504 (Artificial Intelligence & Expert System (CSE, IT))

B.Tech-5th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note: Attempt five questions in all, selecting one question each from section A, B, C and D. Q. No.9 is compulsory.

SECTION-A

- (a) Define intelligent agents and their types?
(b) What is mean-end analysis? Discuss with an example. (10)
- (a) What are production systems and their components?
(b) Compare minmax and alpha-beta pruning taking an example. (10)

SECTION-B

- Explain backward reasoning. Prove that the following sentence is inconsistent: 1. Ram loves Sita and Geeta is not happy but her parents are happy. 2. If Ram marries Sita then Harsh and her friend Geeta will be happy. 3. Ram will marry Sita if Sita loves Ram. (10)
- What is meant by structured knowledge representation? Prove that the following sentence is valid: "If I work whole night on this problem then I can solve it. If I solve the problem, then I will understand the topic. Therefore, I will work whole night on this problem then I will understand the topic". (10)

2

SECTION-C

CS-504

- Describe Boltzman machine in detail. Also, define Hopfield network. (10)
- Genetic algorithms maintain several possible solutions, whereas simulated annealing works with one solution. Is the statement correct? Justify your answer. (10)

SECTION-D

- In the context of Expert Systems, describe what the term "knowledge acquisition" covers. Also, outline how Expert Systems can be distinguished from more conventional computer systems. (10)
- Suppose you have a neural network that is overfitting to the training data. Describe the ways to fix this situation. (10)

SECTION-E (Compulsory)

- Answer following questions in brief: (10×2=20)
 - What is Information in AI?
 - Discuss Depth First Search.
 - What are qualifiers?
 - What is use of cut in PROLOG?
 - What is back-propagation algorithm?
 - What are the operators of genetic algorithm?
 - What is checker in game playing?
 - What is meant by Semantic analysis?
 - What is backward chaining in Expert System?
 - What is language parsing?

J-FB-22-00307

B. Tech. EXAMINATION, 2022

Semester V (CBCS)

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM
(CSE, IT)

CS-504

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. 9 is compulsory.

Section A

- 1. (a) Explain the A* algorithm in detail. 5
- (b) Describe Minimax algorithm in game theory. 5

2. Explain Breadth, Depth and Best first search with examples. 10

Section B

3. (a) What do you mean by knowledge representation? Describe types of knowledge. 5
(b) Write down Key differences between forward and backward reasoning. 5

4. (a) Explain Converting English to PROLOG facts and rules. 5
(b) Describe Conjunctive normal form and Disjunctive normal form. 5

Section C

5. (a) Explain Genetic operators. 5
(b) Explain Back-propagation learning. 5

6. (a) Explain Hopfield network. 5
(b) Describe problems with genetic algorithms. 5

Section D

7. (a) What is Expert system? Explain characteristics of expert system. 5

(b) Explain some Knowledge representation languages. 5

8. (a) Differentiate top-down and bottom-up parsing. 5
(b) Define the terms Knowledge engineering and inferencing. 5

(Compulsory Question)

2 x 10 = 20

9. Write short notes on the following :

- (a) Intelligent agents
- (b) Hill climbing
- (c) AND/OR graph
- (d) Knowledge
- (e) Well-formed formula
- (f) PROLOG
- (g) Genetic algorithm
- (h) Natural Language
- (i) Backward chaining
- (j) Forward chaining.