Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.–7,8)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

Paper ID : [A2985]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Explain the following in brief :

1. Need of formulating the problems in AI.
2. Alpha-beta pruning.
3. Advantages of logical reasoning.
4. Implementation challenges in temporal constraints.
5. Characteristics of bayes rule.
6. Role of reinforcement learning in AI.
7. Major reasons for growth of intelligent agents.
8. Features of utility functions in decision making.
9. Significance of planning in the blocks world.
10. Future scope of artificial intelligence.

SECTION-B

11. Give details of the year-wise development of AI. How AI is being used in the area of medical research?

12. Describe any four informed searching techniques with suitable examples.

13. Differentiate between forward chaining and backward chaining.

14. Discuss the various in-built functions used in LISP.

15. Explain the process of inductive learning using decision trees.

SECTION-C

16. Write an algorithm for A* searching technique. Explain with the help of suitable example.

17. Discuss the role of uncertainty in AI. Explain decision theoretic expert systems in brief.

18. Differentiate between the various learning methods: neural networks, reinforcement learning and genetic algorithms.

Total No. of Pages: 02

Roll No. | | | | | | | | | | |

Total No. of Questions: 09

B.Tech. (CSE) (2011 Onwards) (Sem. – 7, 8)

ARTIFICIAL INTELLIGENCE

M Code: 71893

Subject Code: BTCS-701

Paper ID: [A2985]

Max. Marks: 60

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

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

SECTION A

1. a) State the relationship between Intelligence and Knowledge.

   b) Define terms 'Fact' and 'Rule'.

   c) What are the various applications of AI?

   d) What are the features of NLP?

   e) Briefly explain syntactic processing.

   f) What is rule based learning?

   g) What is an inference engine?

   h) Mention the criteria for the evaluation of search strategy.

   i) Express 'A car without wheels is not valuable' in predicate logic.

   j) What is Heuristics?

SECTION B

2. Distinguish between forward and backward chaining.
3. What is the common way to represent and parse Grammars for natural language processing?
4. Explain state space approach for solving any AI problem.

5. How AI handles decision under uncertainty?
6. What are the differences and similarities between problem solving and planning?

SECTION C

7. Discuss the role of reasoning in AI. How predicate logic is used in AI to represent knowledge?
8. Explain A* searching technique in detail with example. Discuss conditions for the optimality of this technique.
9. Explain back propagation algorithm for nueral nets.

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Roll No. [redacted]

Total No. of Questions : 1[redacted]

Total No. of Pages : 02

B.Tech.(CSE) (2012 to 2017) (Sem.–7,8)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

M.Code : 71893

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Write briefly :

1) What is state space search?

2) What is Conflict Resolution Strategies?

3) What is an expert system shell?

4) What is a frame problem?

5) What is an inference engine?

6) What is a Rule based programming?

7) What is a monotonic Production System?

8) What is learning by induction?

9) What is probabilistic reasoning?

10) What is a search path?

SECTION-B

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

12) How AI handles reasoning under uncertainity. Explain with example.

13) Explain the following with example :

    a) Forward reasoning

    b) Non Monotonic Reasoning

14) With examples explain how unification algorithm works?

15) What are the possible heuristics for the Travelling salesman problem?

SECTION-C

16) What do you understand by supervised and unsupervised learning? What are the major characteristics and differences between them?

17) What are the steps in the natural language processing? How various grammars are constructed?

18) Describe the similarities and differences between learning automata and gentic algorithms. Which learner would be best at finding optimal solutions to nonlinear functions? Give reasons to support your answer.

Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.–7,8)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.**

SECTION-A

1. What is an expert system?
2. Explain fuzzy set.
3. What is the relevance of search and control strategies in problem solving?
4. What are the Problem Characteristics of Artificial Intelligence?
5. What is Heuristics?
6. Distinguish between fact and Predicate.
7. Explain the Bayesian Networks.
8. Explain Fuzzy logic.
9. What is conditional planning?
10. What is state space?

SECTION-B

11. Describe briefly the applications of reinforcement learning.

12. Explain with examples 'Decision Trees'.

13. Explain Bayesian networks with example.

14. What are the advantages of Genetic Algorithms?

15. Distinguish between Forward and backward chaining.

SECTION-C

16. Explain A* algorithm with example.

17. List various components of natural language understanding process. Describe syntactic analysis and semantic analysis in brief.

18. What are the limitations of Predicate logic as a tool for Knowledge representation? Illustrate through examples.

Roll No.

Total No. of Questions : 18

Total No. of Pages : 03

B.Tech. (CSE) (2012 to 2017) (Sem.–7)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-701

M.Code : 71893

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions ca
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2. SECTION-B contains FIVE questions carrying FIVE marks e
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SECTION-A

Write briefly :

1) What is state space search for water jug problem?

2) What is Conflict Resolution Strategies?

3) What is decision tree?

4) What is a Rule based learning?

5) What is a monotonic Production System?

6) How recursion is implemented in lisp?

7) What is declarative knowledge?

8) What is an agent?

9) What is an expert system?

10) What is a frame problem?

SECTION-B

11. Explain the AO* algorithm. Under what situations it can be used?

12. Express the following as semantics net with interconnected nodes and labeled arcs :

"Company ABC is a software development company. Three departments within the company are Sales, Administration and Programming. Joe is a manager of programming. Bill and sue are programmer. Sue is married to Sam. Sam is editor of PHi. They have three children, and they live on Elm Street. Sue wears glasses and is 5.5 feet tall".

13. What is meant by a "Knowledge-Based System"? Describe the basic components of a knowledge- based system. Also mention the various levels of knowledge representation.

14. Differentiate between Data, Belief, Hypothesis & Knowledge. What is tautology? Give an example.

15. Derive a parse tree for the sentence "Bill Loves the Frog" where the following rules are used :

$S \rightarrow NP\ VP$

$NP \rightarrow N$

$NP \rightarrow DET\ N$

$VP \rightarrow V\ NP$

$DET \rightarrow the$

$V \rightarrow loves$

$N \rightarrow bill \mid frog$

SECTION-C

16. What do you understand by unsupervised learning? What are the major characteristics?

17. What is minimax search for game playing? Explain the Min Max algorithm.

18. Consider the following sentences :

John likes all kind of food

Apples are food

Chicken is food

Anything anyone eats and is not killed by is a food

Bill eats peanuts and is still alive

Sue eats everything Bill eats

a) Translate these sentences into formulas in predicate logic.

b) Prove that john like peanuts using backward chaining.

c) Convert the formula into clause form.

d) Prove that John likes peanuts using resolution.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (CSE) PIT (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-602-18

M.Code : 79250

Date of Examination : 05-07-22

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 FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) Multi-agent environment

b) Search graph

c) Heuristic search

d) Depth first search

e) Probabilistic reasoning

f) Bayesian networks

g) Markov decision process

h) Policy iteration in Markov decision process

i) Q-learning algorithm in reinforcement learning

j) Temporal difference learning.

SECTION-B

2. Discuss the various issues and challenges in Artificial Intelligence.

3. Explain any one game search technique in Artificial Intelligence.

4. Describe the concept of conditional probability in detail.

5. How does utility functions work in Markov decision process?

6. Explain how the Bayesian networks are represented and constructed?

SECTION-C

7. Discuss the searching algorithm with closed and open list. Give suitable example.

8. Differentiate between tree and graph structures.

9. With the help of suitable illustrations, describe the importance of Q-learning algorithm in reinforcement learning.

Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-602-18

M.Code : 79250

Date of Examination : 06-06-23

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 FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a. What do you mean by state space representation?

b. What do you mean by policy iteration?

c. What is decision tree?

d. What is heuristic search?

e. What is rule based learning?

f. What do you mean by open list?

g. Define temporal difference learning.

h. Define random search?

i. Role of AI in today's era.

j. What is an expert system?

SECTION-B

2. Explain Depth First Search, in detail.

3. What do you mean by AI? Explain contribution of AI in various fields.

4. Explain hidden Markov model in detail.

5. What do you mean by MDP? Explain.

6. Explain Knowledge based system in detail with suitable example.

SECTION-C

7. What are the characteristics of AI problem? Explain with the help of example.

8. What do you mean by Reinforcement Learning? Explain practical applications of RL.

9. Explain Beat First Search and Game Search, in detail with suitable examples.

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Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech. (CSE) (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-602-18

M.Code : 79250

Date of Examination : 16-12-2022

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

INSTRUCTIONS TO CANDIDATES :

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3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

(a) Artificial Intelligence

(b) Intelligent agent

(c) Best, first search

(d) Random search

(e) Conditional probability

(f) Hidden Markov model

(g) Markov decision process

(h) Partially observable Markov decision process

(i) Passive reinforcement learning

(j) Adaptive dynamic programming.

SECTION-B

2. Differentiate between tree and graph structures.

3. "*A* Search algorithm is one of the best and popular technique used in path-finding and graph traversals*". Justify.

4. In a class, there are 70% of the students who like English and 40% of the students who likes English and Mathematics, and then what is the percent of students those who like English also like Mathematics?

5. How does value iteration work in Markov decision process?

6. Discuss the Q-learning algorithm in reinforcement learning.

SECTION-C

7. Differentiate between depth first and breadth first search.

8. Discuss the various application areas of Artificial Intelligence.

9. How Bayesian networks are represented? Explain.

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B.Tech. (CSE) PIT (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS-602-18

M.Code : 79250

Date of Examination : 05-07-22

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

INSTRUCTIONS TO CANDIDATES :

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d) Depth first search

e) Probabilistic reasoning

f) Bayesian networks

g) Markov decision process

h) Policy iteration in Markov decision process

i) Q-learning algorithm in reinforcement learning

j) Temporal difference learning.

SECTION-B

2. Discuss the various issues and challenges in Artificial Intelligence.

3. Explain any one game search technique in Artificial Intelligence.

4. Describe the concept of conditional probability in detail.

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6. Explain how the Bayesian networks are represented and constructed?

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