


<b>Name:</b> <b>Enrolment No:</b>	 UNIVERSITY WITH A PURPOSE
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, July 2020</b>	
<b>Course: Artificial Intelligence</b> <b>Program: Btech CS OSSOS</b> <b>Course Code: CSEG344</b>	<b>Semester: VI</b> <b>Time : 02 hrs.</b> <b>Max. Marks: 100</b>
<b>Instructions:</b>	

This Test has 89 attempts. For information on editing questions, click **More Help** below. X

## Test Canvas: AI\_End\_Sem\_Exam

The Test Canvas lets you add, edit and reorder questions, as well as review a test. [More Help](#)

Question Settings

You can edit, delete or change the point values of test questions on this page. If necessary, test attempts will be regraded after you submit your changes.

Description	
Instructions	
Total Questions	60
Total Points	100
Number of Attempts	89

Select: All None Select by Type: - Question Type - v

Delete and Regrade

Points

Update and Regrade

Hide Question Details

1. **Multiple Choice: The performance of an agent can be im...**

Points: 1

<b>Question</b>	The performance of an agent can be improved by _____
<b>Answer</b>	Observing
	Learning
	Perceiving
	None of the above

2. Multiple Choice: The action of the Simple reflex agent...

Points: 1

Question	The action of the Simple reflex agent completely depends upon _____
Answer	<p>Perception History</p> <p>Learning Theory</p> <p><input checked="" type="checkbox"/> Current Perception</p> <p>Utility Functions</p>

 3. Multiple Choice: An Artificial Neural Network Is based on

Points: 1

Question	An Artificial Neural Network Is based on
Answer	<p>Strong Artificial Intelligence approach</p> <p>Weak Artificial Intelligence approach</p> <p><input checked="" type="checkbox"/> Cognitive Artificial Intelligence approach</p> <p>Applied Artificial Intelligence approach</p>

 4. Multiple Choice: What is the primary interactive metho...

Points: 1

Question	What is the primary interactive method of communication used by humans?
Answer	<p>Reading</p> <p><input checked="" type="checkbox"/> Speaking</p> <p>Writing</p> <p>All of the above</p>

 5. Multiple Choice: An expert system differs from a datab...

Points: 1

Question	An expert system differs from a database program in that only an expert system _____
----------	--

Answer

- contains procedural knowledge
- contains declarative knowledge
- features the retrieval of stored information
- expects users to draw their own conclusions

 6. Multiple Choice: Natural language understanding is use...

Points: 1

Question

Natural language understanding is used in \_\_\_\_\_

Answer

- natural language interfaces
- natural language front ends
- text understanding systems
- all of the mentioned

 7. Multiple Choice: An Artificial Intelligence technique ...

Points: 1

Question

An Artificial Intelligence technique that allows computers to understand associations and relationships between objects and events is called \_\_\_\_\_

Answer

- heuristic processing
- cognitive science
- relative symbolism
- pattern matching

 8. Multiple Choice: What is the field that investigates t...

Points: 1

Question

What is the field that investigates the mechanics of human intelligence?

Answer

- history
- cognitive science

psychology

sociology

9. Multiple Choice: What is the main task of a problem-so...

Points: 1

Question	What is the main task of a problem-solving agent?
Answer	Solve the given problem and reach to goal
	To find out which sequence of action will get it to the goal state
	<input checked="" type="checkbox"/> All of the mentioned
	None of the mentioned

10. Multiple Choice: What is state space?

Points: 1

Question	What is state space?
Answer	The whole problem
	Your Definition to a problem
	<input checked="" type="checkbox"/> Representing your problem with variable and parameter
	Problem you design

11. Multiple Choice: The Set of actions for a problem in a...

Points: 1

Question	The Set of actions for a problem in a state space is formulated by a _____
Answer	<input checked="" type="checkbox"/> "Successor function, which takes current action and returns next immediate state"
	Intermediate states
	Initial state
	None of the mentioned

12. Multiple Choice: A problem solving approach works well...

Points: 1

Question	A problem solving approach works well for _____
Answer	8-Puzzle problem
	8-queen problem
	<input checked="" type="checkbox"/> Mars Hover (Robot Navigation)
	Finding a optimal path from a given source to a destination

 13. Multiple Choice: Web Crawler is a/an \_\_\_\_\_

Points: 1

Question	Web Crawler is a/an _____
Answer	Problem-solving agent
	Simple reflex agent
	Model based agent
	<input checked="" type="checkbox"/> Intelligent goal-based agent

 14. Multiple Choice: A\* algorithm is based on \_\_\_\_\_

Points: 1

Question	A* algorithm is based on _____
Answer	Breadth-First-Search
	<input checked="" type="checkbox"/> Best-First-Search
	Hill climbing
	Depth-First Search

 15. Multiple Choice: Heuristic function  $h(n)$  is \_\_\_\_\_

Points: 1

<b>Question</b>	Heuristic function $h(n)$ is _____
<b>Answer</b>	<p>Lowest path cost</p> <hr/> <p><input checked="" type="checkbox"/> Estimated cost of cheapest path from root to goal node</p> <hr/> <p>Cheapest path from root to goal node</p> <hr/> <p>Average path cost</p>

16. Multiple Choice: Which is used to improve the performa...

Points: 1

<b>Question</b>	Which is used to improve the performance of heuristic search?
<b>Answer</b>	<p>Quality of nodes</p> <hr/> <p><input checked="" type="checkbox"/> Quality of heuristic function</p> <hr/> <p>Simple form of nodes</p> <hr/> <p>None of the mentioned</p>

17. Multiple Choice: Which of the following is/are Uninfo...

Points: 1

<b>Question</b>	Which of the following is/are Uninformed Search technique/techniques?
<b>Answer</b>	<p>Breadth First Search (BFS)</p> <hr/> <p>Depth First Search (DFS)</p> <hr/> <p>Bidirectional Search</p> <hr/> <p><input checked="" type="checkbox"/> All of the above</p>

18. Multiple Choice: The time and space complexity of BFS ...

Points: 1

<b>Question</b>	The time and space complexity of BFS is (For time and space complexity problems consider $b$ as branching factor and $d$ as depth of the search tree.)
<b>Answer</b>	$O(b^2)$ and $O(d^2)$

O(d2) and O(b2)

O(d2) and O(d2)

O(bd+1) and O(bd+1)

19. Multiple Choice: Which of the Following problems can b...

Points: 1

**Question** Which of the Following problems can be modeled as CSP?

**Answer** 8-Puzzle problem

8-Queen problem

Map coloring problem

All of the above

20. Multiple Choice: The term \_\_\_\_\_ is used for a de...

Points: 1

**Question** The term \_\_\_\_\_ is used for a depth-first search that chooses values for one variable at a time and returns when a variable has no legal values left to assign.

**Answer**  Backtrack search

Forward search

Hill algorithm

Reverse-Down-Hill search

21. Multiple Choice: Consider a problem of preparing a sch...

Points: 2

**Question** Consider a problem of preparing a schedule for a class of student. What type of problem is this?



**Answer**

Search Problem

Backtrack Problem

Planning Problem

CSP

22. Multiple Choice: Constraint satisfaction problems on f...

Points: 2

Question	Constraint satisfaction problems on finite domains are typically solved using a form of _____
Answer	<input type="checkbox"/> Search Algorithms
	<input type="checkbox"/> Heuristic Search Algorithms
	<input type="checkbox"/> Greedy Search Algorithms
	<input checked="" type="checkbox"/> All of the above

23. Multiple Choice: When do we call the states are safely...

Points: 2

Question	When do we call the states are safely explored?
Answer	<input type="checkbox"/> A goal state is unreachable from any state
	<input checked="" type="checkbox"/> A goal state is reachable from every state
	<input type="checkbox"/> A goal state is denied access
	<input type="checkbox"/> None of the above

24. Multiple Choice: Which values are independant in minim...

Points: 2

Question	Which values are independant in minimax search algorithm?
Answer	<input checked="" type="checkbox"/> Pruned leaves x and y
	<input type="checkbox"/> Every states are dependant
	<input type="checkbox"/> Root is independent
	<input type="checkbox"/> None of the above

25. Multiple Choice: Which value is assigned to alpha and ...

Question	Which value is assigned to alpha and beta in the alpha-beta pruning?
Answer	Alpha = max
	Beta = min
	<input checked="" type="checkbox"/> Both Alpha = max & Beta = min
	Beta = max

 26. Multiple Choice: Which is identical to the closed list...

Question	Which is identical to the closed list in Graph search?
Answer	<input checked="" type="checkbox"/> Transposition table
	Hill climbing search algorithm
	Depth-first search
	None of the above

 27. Multiple Choice: Which is a refutation complete inference...

Question	Which is a refutation complete inference procedure for propositional logic?
Answer	Clauses
	Variables
	<input checked="" type="checkbox"/> Propositional resolution
	Proposition

 28. Multiple Choice: When the resolution is called as refu...

Question	When the resolution is called as refutation-complete?
Answer	Sentence is satisfiable

- Sentence is unsatisfiable
- Sentence remains the same
- None of the above

29. Multiple Choice: "The adjective first-order distinguis..."

Points: 2

- |          |  |
|----------|--|
| Question | "The adjective first-order distinguishes first-order logic from _____ in which there are predicates having predicates or functions as arguments, or in which one or both of predicate quantifiers or function quantifiers are permitted."    |
| Answer   | <p><input type="checkbox"/> Representational Verification</p> <p><input checked="" type="checkbox"/> Higher Order Logic</p> <p><input type="checkbox"/> Representational Adequacy</p> <p><input type="checkbox"/> Inferential Efficiency</p> |

30. Multiple Choice: How to eliminate the redundant rule m...

Points: 2

- |          |  |
|----------|--|
| Question | How to eliminate the redundant rule matching attempts in the forward chaining?   |
| Answer   | <p><input type="checkbox"/> Decremental forward chaining</p> <p><input checked="" type="checkbox"/> Incremental forward chaining</p> <p><input type="checkbox"/> Data complexity</p> <p><input type="checkbox"/> None of the above</p> |

31. Multiple Choice: Which of the following elements const...

Points: 2

- |          |  |
|----------|--|
| Question | Which of the following elements constitutes the frame structure? |
| Answer   | <p><input checked="" type="checkbox"/></p>                       |

**Answer**

Procedures and default values

Facts or Data

Frame names

Frame reference in hierarchy

32. Multiple Choice: Semantic Network represents \_\_\_\_\_...

Points: 2

Question	Semantic Network represents _____
Answer	Syntactic relation between concepts
	<input checked="" type="checkbox"/> Semantic relations between concepts
	All of the above
	None of the above

33. Multiple Choice: What does the bayesian network provides?

Points: 2

Question	What does the bayesian network provides?
Answer	Partial description of the domain
	<input checked="" type="checkbox"/> Complete description of the domain
	Complete description of the problem
	None of the above

34. Multiple Choice: What is meant by probability density ...

Points: 2

Question	What is meant by probability density function?
Answer	Probability distributions
	<input checked="" type="checkbox"/> Probability distributions for Continuous variables
	Continuous variable
	Discrete variable

35. Multiple Choice: What is the horizon problem in the c...

Points: 2

Question

What is the horizon problem in the context of game-playing programs?

Answer

" a degree of uncertainty, introduced by the presence of an opponent or by chance elements "

- the outcome of a move may not be visible due to search limitations
- the need for arbitration (e.g. by a referee) in some types of games
- the elimination of branches that will never be explored

 36. Multiple Choice: Why is it important in the minimax a...

Points: 2

Question

Why is it important in the minimax algorithm to generate the values of the evaluation function bottom-up rather than calculating them for each node when the node is visited first ( top-down )?

Answer

"Minimax also works top-down, but the bottom-up method is more efficient."

- This is the foundation for considering the possible countermoves by the opponent.
- Because the value of the utility function can only be computed for leaf nodes.
- Otherwise Minimax would have to be called Maximin.

 37. Multiple Choice: Which statement describes the syntax...

Points: 2

Question

Which statement describes the syntax of a formal language for knowledge representation?

Answer

- It describes how a particular sentence relates to the facts in the world.
- It allows the generation of new sentences that follow from a set of given sentences.
- It specifies the admissible configurations of sentences in that language.
- It makes sure that only truth-preserving sentences are admitted in the language.

 38. Multiple Choice: A logical sentence is called satisfi...

Points: 2

<b>Question</b>	A logical sentence is called satisfiable if and only if
<b>Answer</b>	it is constructed according to the syntactical specification of the language
	<input checked="" type="checkbox"/> it is true under all possible interpretations in all possible worlds
	it can be used by an inference procedure to construct a proof
	there exists at least one interpretation for which the sentence is true.

39. Multiple Choice: "A process that is repeated , evaluat..."

Points: 2

<b>Question</b>	"A process that is repeated , evaluated and refined is called as "
<b>Answer</b>	diagnostic
	descriptive
	interpretive
	<input checked="" type="checkbox"/> iterative

40. Multiple Choice: The primary interactive method of com...

Points: 2

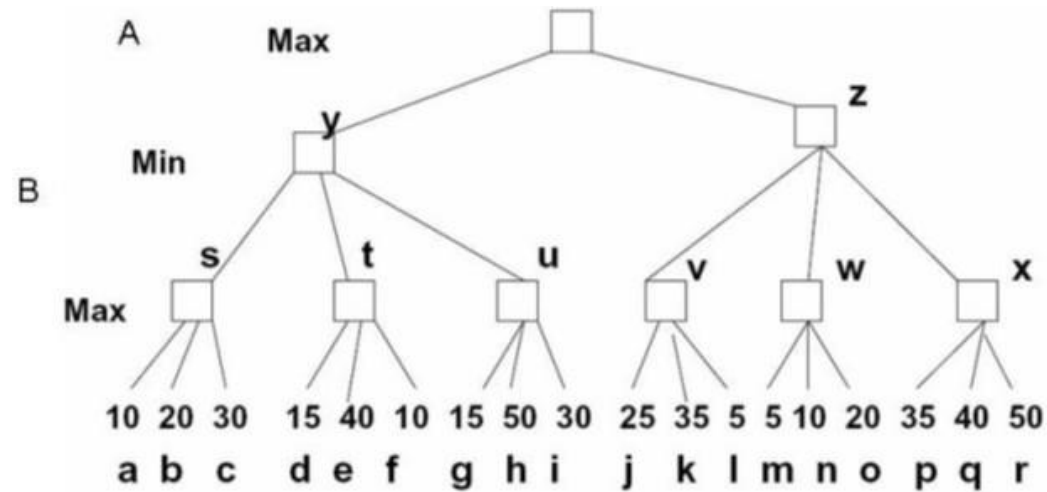
<b>Question</b>	The primary interactive method of communication used by humans is
<b>Answer</b>	reading
	writing
	<input checked="" type="checkbox"/> speaking
	All of the above

41. Multiple Choice: Which nodes will not be visited if ...

Points: 2

<b>Question</b>
-----------------





Which nodes will not be visited if alpha beta search is used ?

Answer

g, i, x, o, q, r

g, i, x, p, o, r

f, i, x, p, q, r

f, i, x, p, o, r

42. Multiple Choice: A , B , C are the binary ...

Points: 2

Question

A	B	C	Y
0	1	1	True
1	1	0	True
1	0	1	False
1	1	1	False
0	1	1	True
0	0	0	True
0	1	1	False
1	0	1	False
0	1	0	True
1	1	1	True

Specific Conditional Entropies		
$H(Y A=0)=0.72$	$H(Y A=0,B=0)=0.00$	$H(Y A=1,C=0)=0.00$
$H(Y A=1)=0.97$	$H(Y A=0,B=1)=0.81$	$H(Y A=1,C=1)=0.81$
$H(Y B=0)=0.92$	$H(Y A=1,B=0)=0.00$	$H(Y B=0,C=0)=0.00$
$H(Y B=1)=0.86$	$H(Y A=1,B=1)=0.92$	$H(Y B=0,C=1)=0.00$
$H(Y C=0)=0.00$	$H(Y A=0,C=0)=0.00$	$H(Y B=1,C=0)=0.00$
$H(Y C=1)=0.99$	$H(Y A=0,C=1)=0.92$	$H(Y B=1,C=1)=0.97$

A , B , C are the binary inputs and Y is the output. Which attribute has the highest information gain?

Answer

A

B

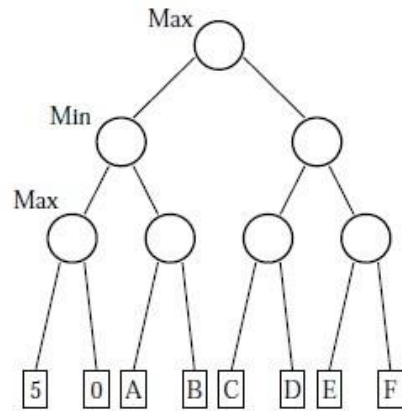
C

All attributes are equal

43. Multiple Choice: Assume the nodes are explored from ...

Points:

Question



Assume the nodes are explored from left to right and standard alpha beta pruning is used. If you are allowed to assign A-F arbitrarily, what is the MAXIMUM number of leaves that can be pruned ?

Answer

1

2

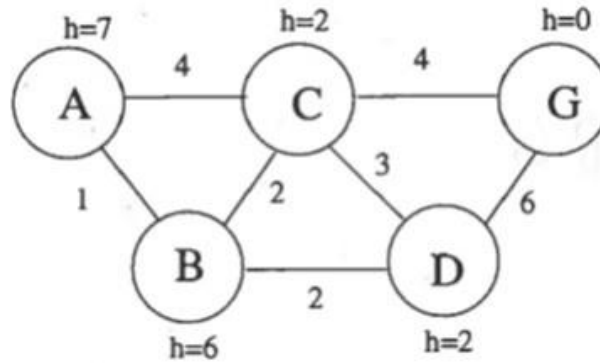
5

None of the above

44. Multiple Choice: Perform A\* search with an expanded...

Points: 2

Question



Perform A\* search with an expanded list. What will be the total estimated cost using partial path

Answer

4

6

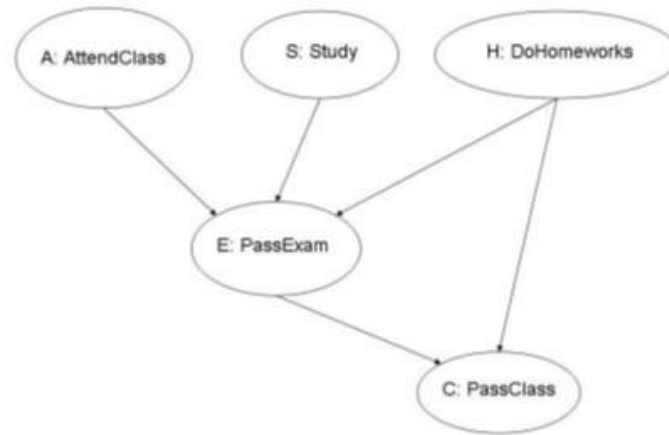
7

None of the above

45. Multiple Choice: Write down the joint distribution a...

Points: 2

Question



Write down the joint distribution as it factorizes according to the graph above.

Answer



$$P(A, S, H, E, C) = P(A) * P(S) * P(H) * P(E|A, S, H) * P(C|E, H)$$

$$P(A, S, H, E, C) = P(A) * P(E) * P(H) * P(E|A, S, H) * P(C|E, H)$$

$$P(A, S, H, E, C) = P(A) * P(C) * P(H) * P(E|A, S, H) * P(C|E, H)$$

$$P(A, S, H, E, C) = P(A) * P(S) * P(H) * P(A, S, H) * P(C|E, H)$$

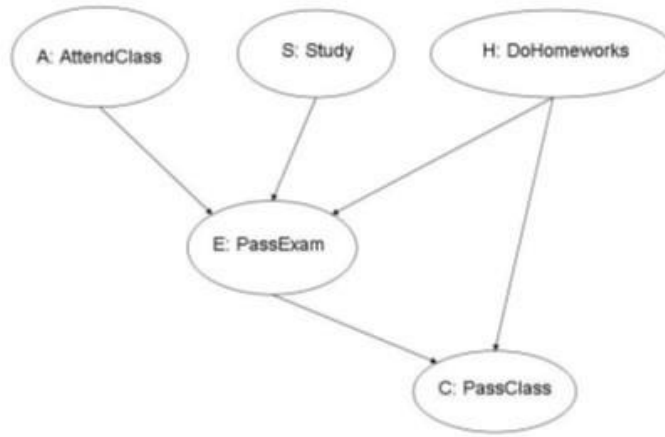
46. Multiple Choice: Use the following CPTs for the graph ...

Points: 2

Question

Use the following CPTs for the graph to compute  $P(A|C,H)$ .

$P(A) = 0.5$ ,  $P(S) = 0.7$ ,  $P(H) = 0.9$



Answer

0.41

0.7875

0.432

0.5206

47. Multiple Choice: Let A and B ...

Points: 2

Question

Let A and B be two binary random variables independent events with probabilities  $P(A = 1) = 0.1$  and  $P(B = 1) = 0.4$ . Let C denote the event that at least one of the events A and B is on, i.e.,  $C = A \text{ OR } B$ , and let D be the event that exactly one of the events A and B occurs, i.e.,  $D = A \text{ XOR } B$ .  
Compute  $P(D|A)$

Answer

0.42

0.46

0.139

 0.143

 48. Multiple Choice: Write the following statements in Fir...

Points: 2

## Question

Write the following statements in First Order Logic:

“Every city has a postman that has been bitten by every dog in the city.”

Use predicates:

- City(x) means x is a city
- Postman(x) means x is a postman
- Dog(x) means x is a dog
- Lives(x, y) means x lives in city y
- Bit(x, y) means x bit y

## Answer

  $\forall c. \text{City}(c) \rightarrow (\exists p. \text{Postman}(p) \wedge \text{Lives}(p, c) \wedge (\forall d. \text{Dog}(d) \wedge \text{Lives}(d, c) \rightarrow \text{Bit}(d, p)))$ 


---

 $\forall c. \text{City}(c) \rightarrow (p. \text{Postman}(p) \wedge \text{Lives}(p, c) \wedge (\forall d. \text{Dog}(d) \wedge \text{Lives}(d, c) \rightarrow \text{Bit}(d, p)))$ 


---

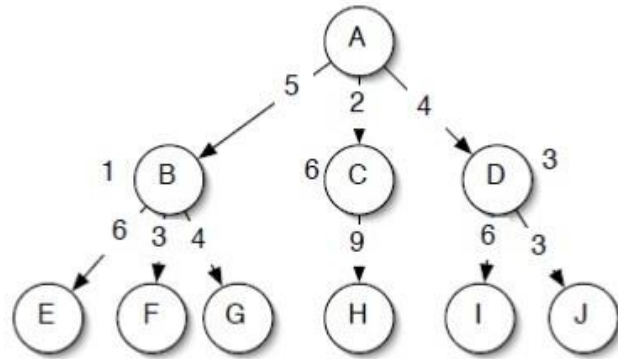
 $\forall c. \text{City}(c) \rightarrow (\exists p. \text{Postman}(p) \wedge \text{Lives}(p, c) \wedge (d. \text{Dog}(d) \wedge \text{Lives}(d, c) \rightarrow \text{Bit}(d, p)))$ 


---

 $\forall c. \text{City}(c) \rightarrow (\exists p. \text{Postman}(p) \wedge \text{Lives}(p, c) \wedge (\forall d. \text{Dog}(d) \wedge \text{Lives}(d, c) \rightarrow \text{Bit}(d)))$ 
 49. Multiple Choice: Write the sequence of states expand...

Points: 2

## Question



Write the sequence of states expanded by Best First Search for the graph where A is the starting node and J is the goal state.

Answer

ABCDEF GHIJ

AABCDABEFGCHDIJ

ABEFGDIJ

ABEFGCHDIJ

50. Multiple Choice: Write the following statement in Fir...

Points:

Question



Write the following statement in First Order Logic:

“All blocks supported by blocks that have been moved have also been moved.”

Use predicates:

- Block(x) means x is a block
- Supports(x, y) means x supports y
- Moved(x) means x has been moved

**Answer**

$\forall x. \forall y. \text{Block}(x) \wedge \text{Block}(x,y) \wedge \text{Supports}(x, y) \wedge \text{Moved}(x) \rightarrow \text{Moved}(y)$

$\forall x. \text{Block}(x) \wedge \text{Block}(y) \wedge \text{Supports}(x) \wedge \text{Moved}(x) \rightarrow \text{Moved}(y)$

$\forall x. \text{Block}(x) \wedge \text{Block}(y) \wedge \text{Supports}(x) \wedge \text{Moved}(x) \rightarrow \text{Moved}(y)$

$\forall x. \forall y. \text{Block}(x) \wedge \text{Block}(y) \wedge \text{Supports}(x, y) \wedge \text{Moved}(x) \rightarrow \text{Moved}(y)$

**51. Multiple Choice: Consider the following interpretation...**

Points: **2**

**Question**

Consider the following interpretation of a language with a unary predicates P, Q, and a binary Predicate R.

- Universe = {1, 2, 3, 4}
- P = {h1i, h3i}
- Q = {h2i, h4i}
- R = {h3, 2i, h4, 3i, h3, 1i, h4, 2i, h2, 1i, h4, 1i}

Circle the sentence below that do not hold in that interpretation.

**Answer**

$\forall x. P(x) \rightarrow \neg Q(x)$

$$\forall x.Q(x) \rightarrow \neg P(x)$$

$$\forall x.Q(x) \rightarrow \exists y.R(x, y)$$

$$\forall x.P(x) \rightarrow \exists y.R(x, y)$$

52. Multiple Choice: Given the following KB:  $\forall x.P(x) \rightarrow \dots$

Points: 2

Question

Given the following KB:

$$\forall x.P(x) \rightarrow P(f(x))$$

$$\neg P(f(f(A)))$$

Circle the correct option after resolution proof.

Answer

$$P(f(A))$$

$$P(A)$$

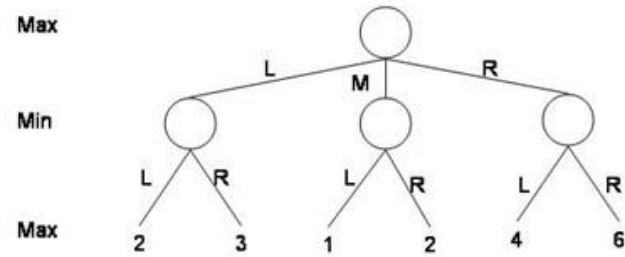
$$\neg P(f(A))$$

None of the above

53. Multiple Choice: Using alpha-beta pruning, consider ...

Points: 2

Question



Using alpha-beta pruning, consider the nodes from right to left, which nodes are cut off ?

Answer

2 , 3

2 , 1

1 , 3

4 , 6

54. Multiple Choice: Write down the FOL for the statement ...

Points:

Question

Write down the FOL for the statement

“All farmer’s wives cut the tail off blind mice that chase them”

Answer

$\forall x \forall y \text{FarmersWife}(x) \wedge \text{Blind}(y) \wedge \text{Mouse}(y) \wedge \text{Chase}(y, x) \rightarrow \text{Cut}(x, y)$

$\forall x \forall y \text{FarmersWife}(x) \wedge \text{Blind}(y) \wedge \text{Mouse}(y) \wedge \text{Chase}(x, y) \rightarrow \text{Cut}(x, y)$

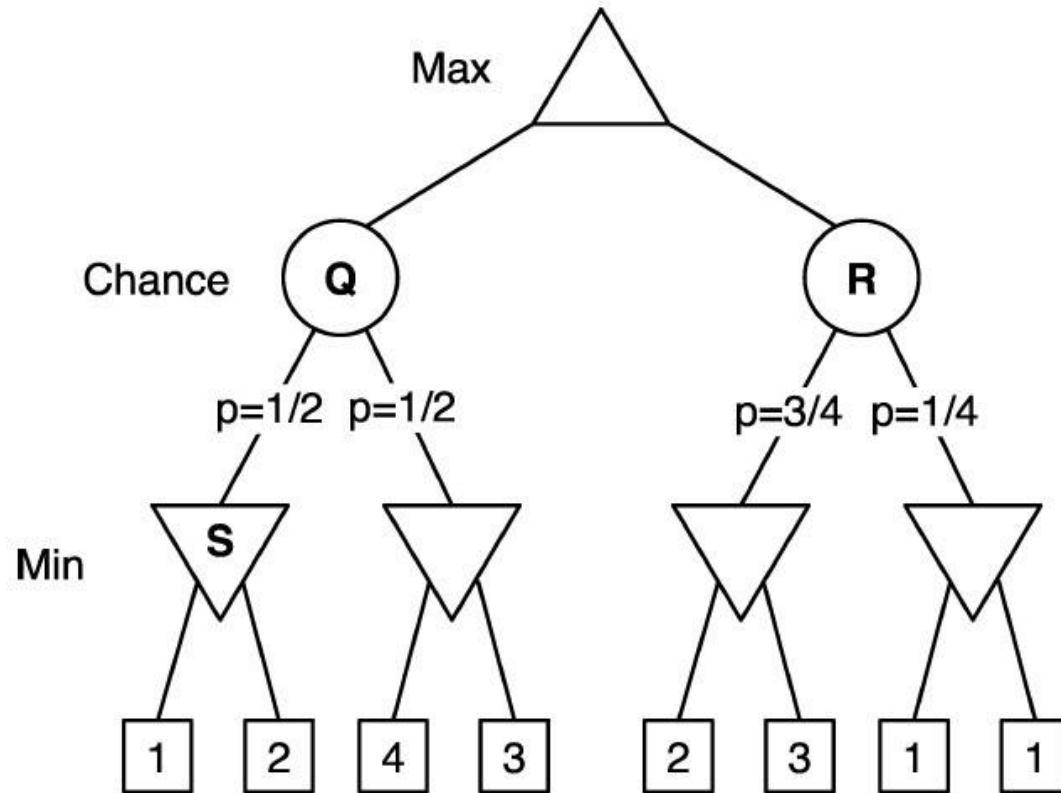
$\forall x \forall y \text{FarmersWife}(x) \wedge \text{Blind}(y) \wedge \text{Mouse}(y) \wedge \text{Chase}(y, y) \rightarrow \text{Cut}(x, y)$

$$\forall x \forall y \text{FarmersWife}(x) \wedge \text{Blind}(y) \wedge \text{Mouse}(y) \wedge \text{Chase}(y, x) \rightarrow \text{Cut}(y, x)$$

55. Multiple Choice: What is the expected value of node Q

Points: 2

Question



What is the expected value of node Q

Answer

1/2

2/3

1





56. Multiple Choice: Which of the following is NOT a good ...

Points: 2

Question

Which of the following is NOT a good way to define AI?

Answer

AI is the use of algorithms that enable computers to find patterns without humans having to hard code them manually.

AI is Augmented Intelligence and is not intended to replace human intelligence rather extend human capabilities.

AI is the application of computing to solve problems in an intelligent way using algorithms.

AI is all about machines replacing human intelligence.

 57. Multiple Choice: Which of these is NOT a current appli...

Points: 2

Question

Which of these is NOT a current application of AI?

Answer

Classifying rock samples to identify best places to drill for oil



Making precise patient diagnosis and prescribing independent treatment

Self-Driving vehicles utilizing Computer Vision to navigate around objects

## Collaborative Robots helping humans lift heavy containers

 58. Multiple Choice: Which of the following is NOT an attr...

Points: 2

Question

Which of the following is NOT an attribute of Unsupervised Learning?

Answer

It is useful for clustering data, where data is grouped according to how similar it is to its neighbors and dissimilar to everything else

The algorithm ingests unlabeled data, draws inferences, and finds patterns from unstructured data

It is useful for finding hidden patterns and or groupings in data and can be used to differentiate normal behavior with outliers such as fraudulent activity

Takes data and rules as input and uses these inputs to develop an algorithm that will give us an answer

 59. Multiple Choice: Which of these activities is NOT requ...

Points: 2

Question

Which of these activities is NOT required in order for a neural network to synthesize human voice?

Answer

Generate audio data and run it through the network to see if it validates it as belonging to the subject

Ingest numerous samples of a person's voice until it can tell whether a new voice sample belongs to the same person

Continue to correct the sample and run it through the classifier, repetitively,till an accurate voice sample is created

Deconstruct sentences to decipher the context of use

60. Multiple Choice: There is concern that some jobs will ...

Points: **2**

Question

There is concern that some jobs will be replaced by AI systems. Which of the following characteristics makes a job a good candidate for replacement?

Answer

Rules-based decision-making

Has very varied, unpredictable tasks.

Features highly creative tasks.

Requires innovative problem solving.

Select: All None Select by Type: - Question Type -

Points