B.Tech. III (Semester 6) CS308-Artificial Intelligence Mid Semester Exam March 2022, Section A

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Objective

Select an appropriate task environment for the below task: crossword puzzle game?

- (●) Fully observable
- ( ) Partially observable

Clear selection

If you want to travel from Surat to Pune city. But when you are traveling from Surat to Pune city and encounter a closed road, then which agent will kick into gear and analyze other routes to get you there, selecting the best option for maximum utility.

- ( ) Reflex agent with states
- ( ) Model based agent
- ( ) Goal based agent
- (●) Utility based agent

Clear selection

In depth first search, is there any guarantee to find a minimal solution if more than one solution exists?

- ○ Yes
- ◉ No

Clear selection

Unification is possible between p(f (a), g(X)) and p(Y ,Y) ?

- ○ Unification is possible
- ◉ Unification is not possible

Clear selection

Krishna says:
"If I'm guilty, I must be punished;
I'm not guilty. Thus I must not be punished."
Is the argument logically correct?

- ○ Yes
- ◉ No

Clear selection

What is meant by the agent's percept sequence?

- ○ Used to perceive the environment
- ○ Complete history of actuator
- ◉ Complete history of perceived things
- ○ None of the mentioned

Clear selection

What rule of inference is used in this argument?
Argument: If Rahul goes swimming, then Rahul will stay in the sun too long. If Rahul stays in the sun too long, then Rahul will sunburn. Therefore, if Rahul goes swimming, then Rahul will sunburn.

- ○ Modus ponens
- ○ Modus tollens
- ○ Addition
- ◉ Hypothetical syllogism

Clear selection

Which of the following produces a reversible environment?

- ○ Chess
- ◉ Maze
- ○ Smart car
- ○ All

Clear selection

What result generated after using skolemization for below statement:
Every philosopher writes at least one book.

- ◉ ∀x[Philo(x) → ∃y[Book(y) ∧ Write(x, y)]]
- ○ ∀x[¬Philo(x) ∨ [Book(g(x)) ∧ Write(x, g(x))]]
- ○ ∀x[¬Philo(x) ∨ ∃y[Book(y) ∧ Write(x, y)]]
- ○ ∀x[¬Philo(x) ∨ [Book(g(x)) ∧ Write(x, G)]]

Clear selection

Which of the following surly reach the solution if any

- ○ BFS
- ○ DFS
- ◉ generate and Test
- ○ None

Clear selection

Define a propositional language which allows to describe the state of a traffic light on different instants. Represent the following fact: the traffic light is either green, or red or orange; Use tgx ="traffic light is green at instant x", trx ="traffic light is red at instant x" and tox ="traffic light is orange at instant x".

- ◉ (tgx <-> (¬trx ^¬tox))^(trx <-> (¬tgx ^¬tox))^(tox <-> (¬trx ^¬tgx))
- ○ (tgx -> (¬trx ^¬tox))^(trx -> (¬tgx ^¬tox))^(tox -> (¬trx ^¬tgx))
- ○ (tgx <-> (trx ^tox))^(trx <-> (tgx ^tox))^(tox <-> (trx ^tgx))
- ○ (tgx -> (trx ^tox))^(trx -> (tgx ^tox))^(tox -> (trx ^tgx))

Clear selection

Translate this statement into English, where the domain for each variable consists of all real numbers.
$\forall x \forall y(((x \geq 0) \wedge (y \geq 0)) \rightarrow (xy \geq 0))$

- ○ For some real numbers x and y, f x and y are both negative then, their product is non-negative.
- ○ For every real number x and real number y, if x and y are both negative then, their product is negative.
- ○ For some real numbers x and y, f x and y are both non-negative then, their product is negative.
- ◉ For every real number x and real number y, if x and y are both non-negative then, their product is non-negative.

Clear selection

It is often more convenient to deal with formulas in which all quantifiers have been moved to the front of the expression. These types of formulas are said to be in

- ○ Conjunctive normal form
- ○ Disjunctive normal form
- ◉ Prenex normal form
- ○ Horn Clauser

Clear selection

Is Depth First Search complete?

- ○ Yes
- ◉ No

Clear selection

The dead end in the search tree will occur in

- ○ Deterministic environment
- ◉ Irreversible environment
- ○ Backtrackable environment
- ○ All

Clear selection

Find free variables in the following formula:
∀z∃u∃y.(q(z, u, g(u, y)) ∨ r(u, g(z, u)))

- ○ x is a free variable
- ○ y is a free variable
- ◉ x and y are free variables
- ○ no free variables

Clear selection

Convert the following sentences to conjunctive normal form.
$(P \rightarrow Q) \rightarrow R$

- ○ $\neg P \vee \neg Q \vee R$
- ○ $(\neg P \vee Q) \vee (\neg Q \vee P)$
- ◉ $(P \vee R) \wedge (\neg Q \vee R)$
- ○ $\neg P \vee Q \vee \neg R$

Clear selection

Select appropriate task environment for below task:
Brushing your teeth task is

- ○ Stochastic and Sequential
- ◉ Deterministic and Episodic
- ○ Stochastic and Episodic
- ○ Deterministic and Sequential

Clear selection

The converse of the statement
"If moon is full, then sky is filled with colors" is

- (●) If sky is filled with colors, then moon is full.
- ( ) If moon is not full, then sky is filled with colors.
- ( ) If sky is clear, then moon is full.
- ( ) If moon is not full, then sky is not filled with colors

Clear selection

_____ search algorithms—algorithms that are given no information about the problem other than its definition.

- ( ) Informed Search
- (●) Uninformed Search

Clear selection

------ is a live node whose children are currently being explored.

- (●) E-node
- ( ) Dead node
- ( ) Both
- ( ) None

Clear selection

What is used to improve the agent's performance over time?

- ○ Perceiving
- ◉ Learning
- ○ Observing
- ○ None

Clear selection

Branch and Bound is the generalization of

- ○ BFS graph search strategies
- ○ DFS graph search strategies
- ◉ Both BFS and DFS graph search strategies
- ○ None

Clear selection

Find out correct statements:
i. In Inheritable knowledge, The knowledge elements inherit attributes from their parents.
ii. In Inheritable knowledge, The basic knowledge representation is not required to be augmented with an inference mechanism.
iii. In Inheritable knowledge, The classes are organized in a generalized hierarchy.
iv. Relational knowledge provides a framework to compare two objects based on equivalent attributes.

- ○ i and ii only
- ○ ii and iii only
- ◉ i, iii and iv only
- ○ All i, ii, iii and iv

Clear selection

If you want to travel from Surat to Pune then which agent will map the right path to get you there.

- ○ Reflex agent
- ○ Model based agent
- ○ Goal based agent
- ◉ Utility based agent

Clear selection

What is not correct for the AI agent?

- ○ To decide the strategy for the state selection
- ○ Reach goal state minimizing the path cost
- ◉ Explore the entire environment
- ○ none

Clear selection

For below sets of premises, what relevant conclusion or conclusions can be drawn?
"If I eat spicy foods, then I have strange dreams." "I have strange dreams if there is thunder while I sleep." "I did not have strange dreams."

- ○ I did not eat spicy foods
- ○ There is no thunder
- ◉ I did not eat spicy foods and it did not thunder
- ○ I eat spicy foods and it thunder

Clear selection

Let Q(x, y) be the statement "student x has been a contestant on quiz show y." Express below sentence in terms of Q(x , y), quantifiers, and logical connectives, where the domain for x consists of all students at your school and for y consists of all quiz shows on television.
Statement: There is a student at your school who has been a contestant on Shark tank and on Masterchef.

- ∀x (Q(x, Shark tank) -> Q(x, Masterchef))
- ∃x (Q(x, Shark tank) ∧ Q(x, Masterchef)) (selected)
- ¬∃x (Q(x, Shark tank) ^ Q(x, Masterchef))
- ∀x (Q(x, Shark tank) ^ Q(x, Masterchef))

Clear selection

The contrapositive of statement
'If Gandhinagar is capital of Gujarat, then Gandhinagar is in India' is

- If Gandhinagar is not in India, then Gandhinagar is not the capital of Gujarat. (selected)
- If Gandhinagar is in India, then Gandhinagar is Capital of Gujarat.
- If Gandhinagar is not the capital of Gujarat, then Gandhinagar is not the capital of India.
- If Gandhinagar is the capital of Gujarat, then Gandhinagar is not in India.

Clear selection

What was the original name of “Imitation game”?

- ○ LISP
- ◉ Turing Test
- ○ Halting problem
- ○ All of the above

Clear selection

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