Module 2-quiz-Fall 23

Due Sep 17 at 11:59pm **Points** 10 **Questions** 10
Available Sep 4 at 12am - Sep 17 at 11:59pm **Time Limit** 300 Minutes

Submission Details:

Time:	27 minutes
Current Score:	9 out of 10
Kept Score:	9 out of 10

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	27 minutes	9 out of 10

Correct answers will be available on Sep 18 at 3am.

Score for this quiz: **9** out of 10
Submitted Sep 17 at 6:02pm
This attempt took 27 minutes.

Question 1 — 1 / 1 pts

Choose the correct propositional logic for the English sentence: "Children and teenagers are not adults"

- (selected) $(Children \vee Teenagers) \rightarrow \neg Adults$
- $(Children \wedge Teenagers) \vee \neg Adults$
- $(Children \vee Teenagers) \vee \neg Adults$
- $(Children \wedge Teenagers) \rightarrow \neg Adults$

Both children or teenagers will not be adults

Question 2 — 1 / 1 pts

Function constants of arity 0 are called as

- Predicate Constants
- (selected) Object Constants
- Proper Constants
- Propositional Constants

Question 3 — 1 / 1 pts

Suppose = {a, P, Q}, where a is object constant, P is Unary and Q is binary predicate constant.

Statement: ∀x P(a) is a Formula. True or False?

- (selected) True
- False

∀x P(a) and P(a) are formulas

Question 4 1 / 1 pts

What are the free variables in the below Formula F1?

F1: (∀x (P(x) ∧ Q(x))) ⟶ (¬ P(x) ∨ Q(y))

1 2 3 4 5

- None
- 2,3,4
- 2,3
- 4,5

Since 2, 3 are bound by 1 , 4 and 5 are the free variables

Question 5 1 / 1 pts

Statement: Following first-order formula is satisfiable. True or False?

{∃x P(x), ∃x Q(x)} ⊨ ∃x (P(x) ∧ Q(x))

- True
- False

For suppose if we take P as even and Q as odd there exists no such element x which is both even and odd so it is false

Incorrect

Question 6 0 / 1 pts

Every student who takes CSE579 is intelligent.

- $\forall x \neg Student\,(x) \vee \neg Takes\,(x, CSE579) \vee Intelligent\,(x)$
- $\exists x \neg Student\,(x) \vee \neg Takes\,(x, CSE579) \vee Intelligent\,(x)$
- $\forall x Student\,(x) \wedge Takes\,(x, CSE579) \rightarrow Intelligent\,(x)$
- $\exists x Student\,(x) \wedge Takes\,(x, CSE579) \rightarrow Intelligent\,(x)$

Question 7 1 / 1 pts

Consider the following statements in first-order logic:

1) $\forall x\,(P\,(x) \wedge Q(x))$

2) $\exists x\,(P\,(x) \wedge Q\,(x))$

3) $\forall x P(x) \wedge \forall x Q(x)$

4) $\exists x P(x) \wedge \exists x Q(x)$

Which of these statements expresses the idea that "Every individual satisfies both properties P and Q"?

- 4
- 1
- 3
- 2

Statement 1, $\forall x (P(x) \wedge Q(x))$, uses a universal quantifier (∀) to state that for every individual x, both P(x) and Q(x) must be true. This represents the concept that every individual in the domain satisfies both properties.

Question 8

1 / 1 pts

Which of the following statements are true for any first-order formula F and G, and for any interpretation I?

1) $(F \vee G)^I = \vee \left(F^I, G^I\right)$

2) $(\neg G)^I = \neg(G^I)$

3) $\exists x F(x)^I = t$ if $F(c^*)^I = t$ for some $c \in |I|$

- 1,2,3
- 1,3
- 2,3
- 1

Question 9

1 / 1 pts

A set of clauses S is Herbrand satisfiable iff, the set of all ground instances of clauses in S is Herbrand satisfiable.

True or False?

- True
- False

Question 10

1 / 1 pts

Every student of CSE579 who reads everyday gets an A in CSE579.

- $\forall x Student(x) \wedge Takes(x, CSE579) \wedge \exists y (Day(y) \wedge ReadsOnDay(x, y)) \rightarrow GetA(x, CSE579))$
- $\forall x Student(x) \wedge Takes(x, CSE579) \wedge \forall y Day(y) \wedge ReadsOnDay(x, y) \rightarrow GetA(x, CSE579)$
-

$\forall x Student\,(x) \wedge Takes\,(x, CSE579) \wedge \forall y\,(Day\,(y) \rightarrow ReadsOnDay(x, y)) \rightarrow GetA(x, CSE579)$

$\forall x \forall y Student\,(x) \wedge Day\,(y) \wedge ReadsOnDay(x, y) \wedge Takes\,(x, CSE579) \rightarrow GetA(x, CSE579)$

Quiz Score: **9** out of 10

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