Question 1

1 / 1 pts

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

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

will not be adults

Function constants of arity 0 are called as

- Object Constants
- Propositional Constants
- Proper Constants
- Predicate 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: $\forall x\ P(a)$ is a Formula. True or False?

- True
- False

Question 4

1 / 1 pts

What are the free variables in the below Formula F1?

F1: $(\forall x\ (P(x) \wedge Q(x))) \longrightarrow (\neg P(x) \vee Q(y))$

1 2 3 4 5

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

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?

$\{\exists x\, P(x), \exists x\, Q(x)\} \models \exists x\, (P(x) \land Q(x))$

- 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

Partial

Question 6

0.5 / 1 pts

Every student who takes CSE579 is intelligent.

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

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"?

- 3
- 2
- 4
- 1

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 $c \in |I|$

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

1 / 1 pts

Question 10

1 / 1 pts

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

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