Module1-quiz-SP23

Due Jan 22 at 11:59pm **Points** 10 **Questions** 10
Available Jan 8 at 11:59pm - Jan 23 at 2:59am
Time Limit 450 Minutes

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	4 minutes	10 out of 10

ⓘ Correct answers will be available on Jan 23 at 9am.

Score for this quiz: **10** out of 10
Submitted Jan 22 at 5:48pm
This attempt took 4 minutes.

Question 1

1 / 1 pts

Consider the following propositional logic formula: (p ∧ q ∧ r) ∨ (¬ p ∧ ¬ q ∧ s) ∨ (¬ r ∧ t)

Which of the following assignments of truth values to variables p, q, r, s, and t will make the formula TRUE?

- I(p)=f, I(q)=f, I(r)=t, I(s)=f, I(t)=t
- I(p)=f, I(q)=t, I(r)=f, I(s)=t, I(t)=f
- I(p)=t, I(q)=f, I(r)=t, I(s)=f, I(t)=t
- ◉ I(p)=t, I(q)=t, r=t, I(s)=t, I(t)=t

Question 2

1 / 1 pts

P and Q are two propositions. Which of the following are equivalent?

I: $P \vee \neg Q$

II: $\neg (\neg P \wedge Q)$

III: $(P \wedge Q) \vee (P \wedge \neg Q) \vee (\neg P \wedge Q)$

IV: $(P \wedge Q) \vee (P \wedge \neg Q) \vee (\neg P \wedge \neg Q)$

- Only I, II and III
- All of I, II, III and IV
- Only I, II and IV

  I and II are equivalent due to DeMorgan's Law. The IVth can be simplified to I.
- Only I and II

Question 3

1 / 1 pts

Which of the following propositional logic formulas is entailed by the statement "p implies q" i.e. $(p \longrightarrow q)$?

- $\neg q$
- $\neg p \vee q$

All interpretations of p and q that satisfy (p ⟶ q) also satisfies the formula on the right i.e. (¬ p ∨ q).

These interpretations are:

I(p)=f, I(q)=f

I(p)=f, I(q)=t

I(p)=t, I(q)=t.

For all the other answer choices, there is at least one interpretation of p and q for which (p ⟶ q) is satisfied but the formula on the right side is not.

- q
- ¬ p
- p

Question 4

1 / 1 pts

Statement: $p \vee \neg p$ is a tautology if and only if $\neg p \wedge p$ is unsatisfiable.

Above statement True or False?

- True

The above statement is True as there are no interpretations for $\neg p \wedge p$ that can be true and therefore it is unsatisfiable. As a result negation of $\neg p \wedge p$ must be a tautology.

- False

Question 5

1 / 1 pts

F: $(p_1 \wedge q_1) \vee (p_2 \wedge q_2) \vee (p_3 \wedge q_3) \vee (p_4 \wedge q_4)$

For the above Formula F how may clauses will be generated by Clausify* (F, Γ) ?

- 16
- 13 ✓

For clausify we will have 2^4 = 16 clauses and for clausify* we will have (1 + 12) = 13 clauses that can be generated.

- 10
- 8

Question 6

1 / 1 pts

F: $p \wedge (\neg p \vee q) \wedge (\neg q \vee r) \wedge (q \vee \neg r)$

Let U be empty set of literals. What will be the result of set U after three iterations if we perform unit propagation for the above formula F.

- U = {p,¬q, ¬r }
- U = {p, ¬q, r}
- U = {p, q, ¬r}
- U = {p, q, r} ✓

By applying unit propagation we get U1 = {p] , U2 = {p,q}, U3= {p,q,r}. At the end of all iterations it comes out to be true.

Question 7

1 / 1 pts

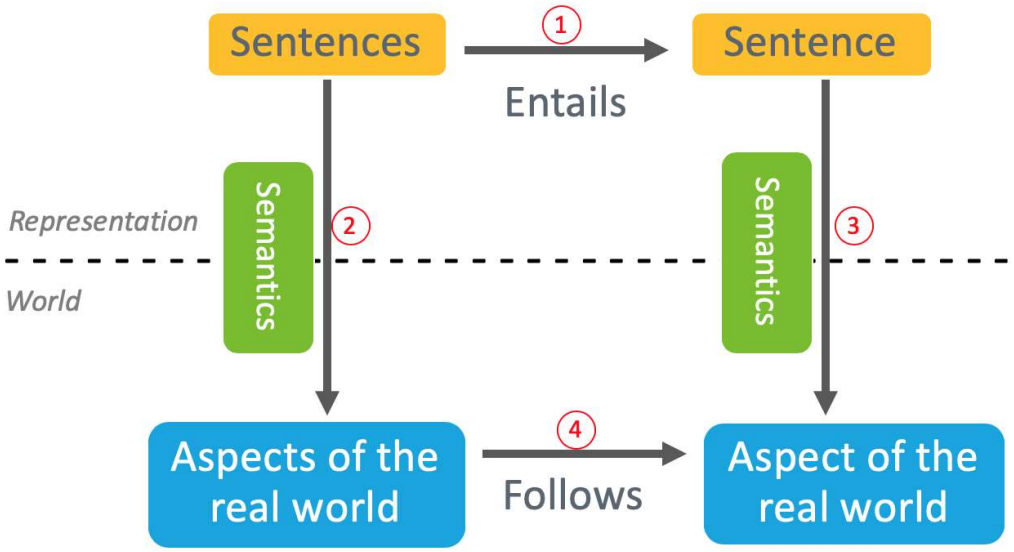
Apply unit propagation on the formula $p \wedge (p \vee q) \wedge (\neg p \vee \neg q) \wedge (q \vee r) \wedge (\neg q \vee \neg r)$ starting with an empty set U of literals. What are the resulting set U of literals from the first three iterations?

- (●) U − 1 = { p } , U − 2 = { p , ¬ q } , U − 3 = { p , ¬ q , r }
- ( ) U − 1 = { p } , U − 2 = { r } , U − 3 = { ¬ q }
- ( ) U − 1 = { p } , U − 2 = { ¬ q } , U − 3 = { r }
- ( ) U − 1 = { p } , U − 2 = { p , r } , U − 3 = { p , r , ¬ q }

Question 8

1 / 1 pts

Consider the following graph where each arrow is denoted by a number in red. Which sequence of arrows best explains the steps for knowledge representation and reasoning?



- ( ) 2 4 1 3
- ( ) 2 3 1 4

- (selected) 2 1 3 4
- ( ) 4 3 1 2

Question 9

1 / 1 pts

Which option is to have a conclusion that is likely to be true even though we do not have enough evidence?

- ( ) Deductive reasoning
- ( ) Abductive reasoning
- ( ) Model finding
- (selected) Default reasoning

Question 10

1 / 1 pts

Suppose p is an atom. Is the following statement true or false?

{⊥} entails ⊥.

- (selected) True
- ( ) False

Quiz Score: **10** out of 10