Prep 2 quiz

Due Jan 18 at 9pm **Points** 5 **Questions** 5
Available until Apr 12 at 9pm **Time Limit** None **Allowed Attempts** Unlimited

Instructions

Readings

Please read the following part of the **Course Notes** (this includes material we covered in Week 1, but also some new material for Week 2).

- Pages 9–26

General instructions

You can review the general instructions for all prep quizzes on the **Course Syllabus**. Remember that you can submit multiple times! You might consider printing this quiz out so that you can work on paper first.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	733 minutes	5 out of 5

Score for this attempt: **5** out of 5
Submitted Jan 14 at 11:35am
This attempt took 733 minutes.

Question 1 — 1 / 1 pts

Complete the truth table shown below. **Hint**: you may find it helpful to do this on paper first, and add columns for the intermediate expressions $p \Rightarrow q$ and $q \vee r$.

p	q	r	$(p \Rightarrow q) \Leftrightarrow (q \vee r)$
False	False	False	False
False	False	True	True
False	True	False	True
False	True	True	True
True	False	False	True
True	False	True	False
True	True	False	True
True	True	True	True

Answer 1:

Correct!

False

Answer 2:

Correct!

True

Answer 3:

Correct!

True

Answer 4:

Correct!

True

Answer 5:

Correct!

True

Answer 6:

Correct!

False

Answer 7:

Correct!

True

Answer 8:

Correct!

True

Question 2

1 / 1 pts

Recall that two propositional formulas are **equivalent** if they have the same value for all truth assignments to their variables. For example, $p \Rightarrow q$ and $\neg q \Rightarrow \neg p$ are equivalent.

The two formulas $(p \Rightarrow q) \Rightarrow r$ and $p \Rightarrow (q \Rightarrow r)$ are *not* equivalent. Select all of the truth assignments for *p*, *q*, and *r* that make these formulas have *different* values.

Correct!

- [x] p = False, q = False, r = False
- [ ] p = False, q = False, r = True

Correct!

- [x] p = False, q = True, r = False
- [ ] p = False, q = True, r = True
- [ ] p = True, q = False, r = False
- [ ] p = True, q = False, r = True
- [ ] p = True, q = True, r = False
- [ ] p = True, q = True, r = True

Question 3

1 / 1 pts

Which of the following formulas is logically equivalent to $(p \Rightarrow q) \Rightarrow r$? (You can do this by writing a few truth tables.)

- $p \vee \neg q \vee r$
- $p \Rightarrow (q \Rightarrow r)$

Correct!

- $r \vee (p \wedge \neg q)$
- $(p \vee q) \Rightarrow r$

Question 4

1 / 1 pts

Let *U* be the set of all New Year's Eve parties, and suppose we define the predicates *P(x)* and *Q(x)* over universe *U* as follows.

- *P(x):* party *x* was loud;
- *Q(x):* party *x* was boring.

For each English statement below, select its correct translation into predicate logic.

Correct! **Every party was loud.** — ∀x ∈ U, P(x)

Correct! **Some party was boring.** — ∃x ∈ U, Q(x)

Correct! **Some loud party was boring.** — ∃x ∈ U, P(x) ∧ Q(x)

Correct! **Every party was loud or boring (or both loud and boring).** — ∀x ∈ U, Q(x) ∨ P(x)

Other Incorrect Match Options:

- ∃x ∈ U, P(x) ∨ Q(x)
- ∀x ∈ U, P(x) ∧ Q(x)

Question 5

1 / 1 pts

Let *U* be the following set of Christmas presents.

U = { lump_of_coal, switch™, pony, castle }

Each present has a different price; they are written above in increasing order of price, with lump_of_coal being the cheapest, and castle being the most expensive.

Define the predicate $P(x, y)$ over *U* as follows:

$P(x, y)$: x is as expensive as y or more expensive than y

For each statement below, select whether it is true or false.

- $\forall x \in U,\ P(x, \text{pony})$ False
- $\exists x \in U,\ P(x, \text{pony})$ True
- $\forall x \in U,\ P(\text{castle}, x)$ True
- $\exists x \in U,\ P(\text{castle}, x)$ True
- $\exists x, y \in U,\ P(x, y)$ True
- $\forall x, y \in U,\ P(x, y)$ False

Answer 1:

Correct!

False

Answer 2:

Correct!

True

Answer 3:

Correct!

True

Answer 4:

Correct!

True

Answer 5:

Correct!

True

Answer 6:

Correct!

False

Quiz Score: **5** out of 5