Mid Term Practice Quiz

1. Which of the following propositional formulas or set of propositional formulas are satisfiable? Choose all that apply.
    a. {p -> q, q -> ¬p}
    b. {p -> q, ¬p, ¬q}
    c. {p v q, ¬p ∧ ¬q}
    d. { p -> q, q, p -> ¬q}

2. Determine which of the following formulas are tautologies. Choose all that apply.
    a. [¬ p ∧ (p ∨ q)] → q
    b. [(p → q) ∧ (q → r)] → [p → r]
    c. (p -> q) -> (q -> p)
    d. (p -> q) ∧ (q -> p)

3. Is the following first-order formula satisfiable?

    ∀x y (x ≠ y)

    a. Unsatisfiable
    b. Satisfiable

4. What are the free variables in the following formula?
    ∃x (P(x, y) → ∀y P(y, x))
    a. y
    b. x
    c. Both x and y
    d. No Free variable

5. Which is a stable model of the given program?

    p ← ¬q

    q ← ¬r

    a. {p, q, r}
    b. {p, q}
    c. {p}
    d. {q}

6. Every positive program has a model. True or False?
    a. True

b. False

7. What do you think is the number of stable models of the given program?

   {p(1..3)}. {q(1..3)}.

   a. 8
   b. 16
   c. 32
   d. 64

8. How many rules are there in the given clingo program?

   {p(I) : I = 1..7}

   a. 1
   b. 2
   c. 7
   d. 8

9. Select all the minimal models for the formula p ∨ q, given the signature {p, q}.
   a. {p}
   b. {q}
   c. {p, q}
   d. All of the above

10. Given the signature: **σ** {a, b, P}, which are the Herbrand interpretations for the given formula?

    P(a) ∧ ¬P(b) ∧ ∃x ¬P(x)

    a. Ø
    b. {P(a)}
    c. {P(b)}
    d. {P(a), P(b)}