Self-Assessment Quiz
Laws of Logic, Conditional and Biconditional Statements

Ungraded Practice — Based on Lecture LOGIC

Instructions: Select the most appropriate answer for each question. This quiz is ungraded and intended for self-study.

Q1. Which of the following is an example of the **De Morgan's Law**?

(a) $\sim (p \wedge q) \equiv (\sim p \wedge \sim q)$

(b) $\sim (p \wedge q) \equiv (\sim p \vee \sim q)$

(c) $\sim (p \vee q) \equiv (\sim p \vee \sim q)$

(d) $p \vee q \equiv q \vee p$

Q2. The statement $\sim (\sim p) \equiv p$ is an example of the:

(a) Double Negative Law

(b) Identity Law

(c) Idempotent Law

(d) De Morgan's Law

Q3. Simplify $(p \wedge q) \vee (p \wedge r)$ using a law of logic.

(a) $p \wedge (q \wedge r)$

(b) $(p \vee q) \wedge (p \vee r)$

(c) $p \wedge (q \vee r)$

(d) $p \vee (q \wedge r)$

Q4. The truth table for a conditional $p \to q$ is false only when:

(a) p is false and q is true

(b) p is true and q is false

(c) both p and q are true

(d) both p and q are false

Q5. In the conditional $p \to q$, p is called the:

(a) consequent

(b) conclusion

(c) hypothesis (antecedent)

(d) negation

Q6. Which of the following is an alternative way of writing "$p \to q$"?

(a) p only if q

(b) p whenever q

(c) p and q

(d) p if and only if q

Q7. The symbolic form of "If you get an A on the final and do all exercises, then you get an A in the class" is:

(a) $p \lor q \to r$

(b) $p \land q \to r$

(c) $r \to (p \land q)$

(d) $r \to p \lor q$

Q8. The negation of "if p then q" is logically equivalent to:

(a) $\sim p \to \sim q$

(b) $p \land \sim q$

(c) $\sim p \lor q$

(d) $p \lor \sim q$

Q9. The inverse of the conditional statement $p \to q$ is:

(a) $q \to p$

(b) $\sim q \to \sim p$

(c) $\sim p \to \sim q$

(d) $\sim p \lor q$

Q10. The converse of the conditional statement $p \to q$ is:

(a) $q \to p$

(b) $\sim q \to \sim p$

(c) $\sim p \to \sim q$

(d) $p \to q$

Q11. The contrapositive of "If it rains, then I will take an umbrella" is:

    (a) If I take an umbrella, then it rains.

    (b) If I do not take an umbrella, then it does not rain.

    (c) If I do not take an umbrella, then it rains.

    (d) If I take an umbrella, then it does not rain.

Q12. The conditional and its contrapositive are always:

    (a) Contradictory

    (b) Equivalent

    (c) Independent

    (d) Inverse

Q13. The biconditional $p \leftrightarrow q$ is true when:

    (a) both p and q are true or both are false

    (b) p is true and q is false

    (c) p is false and q is true

    (d) exactly one of p, q is true

Q14. The biconditional can be expressed as:

    (a) $(p \wedge q) \vee (\sim p \wedge \sim q)$

    (b) $(p \vee q) \wedge (\sim p \vee \sim q)$

    (c) $(p \rightarrow q) \vee (q \rightarrow p)$

    (d) $(p \rightarrow q) \wedge (q \rightarrow p)$

Q15. Which of the following logical equivalences is **true**?

    (a) $p \rightarrow q \equiv \sim p \vee q$

    (b) $p \leftrightarrow q \equiv p \vee q$

    (c) $\sim (p \rightarrow q) \equiv \sim p \vee q$

    (d) $p \rightarrow q \equiv p \wedge q$

Answer Key

Q1	(b)
Q2	(a)
Q3	(c)
Q4	(b)
Q5	(c)
Q6	(a)
Q7	(b)
Q8	(b)
Q9	(c)
Q10	(a)
Q11	(b)
Q12	(b)
Q13	(a)
Q14	(d)
Q15	(a)