

Logic - Unit No. 8 Test # 1

Time: 30 Minutes

Total Marks: 20

Part A: Multiple Choice Questions (1 mark each)

Q1. Which of the following expressions is often related to inductive reasoning?

- a) based on repeated experiments
- b) if and only if statements
- c) Statement is proven by a theorem
- d) based on general principles

Q2. Which of the following is a theorem?

- a) Every even number is divisible by 3
- b) All triangles have three angles
- c) The sum of interior angles of a triangle is 180°
- d) All integers are odd

Q3. Negation of 'The stove is burning' is:

- a) The stove is not burning
- b) The stove is dim
- c) The stove is turned to low heat
- d) It is both burning and not burning

Q4. The conjunction of two statements p and q is true when:

- a) both p and q are false
- b) both p and q are true
- c) only q is true
- d) only p is true

Q5. A conditional is false only when:

- a) antecedent is true and consequent is false
- b) consequent is true and antecedent is false
- c) antecedent is true only
- d) consequent is false only

Part B: Short Questions (2 marks each)

Q1. Define: Define logical statement.

Q2. What is the importance of logical reasoning in proofs? Give an example.

Q3. Prove: $(x - 4)^2 + 9 = x^2 - 8x + 25$

Q4. Write a simple deductive proof for: $(4 + 16x)/4 = 1 + 4x$

Q5. Differentiate between a mathematical statement and a proof with examples.

Part C: Long Question (5 marks)

Q1. Prove: If a, b, c are non-zero real numbers, then $a/b = c/d \Leftrightarrow ad = bc$

Logic - Unit No. 8 Test # 2

Time: 30 Minutes

Total Marks: 20

Part A: Multiple Choice Questions (1 mark each)

Q1. A conditional is false only when:

- a) antecedent is true and consequent is false
- b) consequent is true and antecedent is false
- c) antecedent is true only
- d) consequent is false only

Q2. Which sentence describes deductive reasoning?

- a) general conclusions from a limited number of observations
- b) based on repeated experiments
- c) based on accurate information units
- d) draw conclusion from well-known facts

Q3. Negation of 'The stove is burning' is:

- a) The stove is not burning
- b) The stove is dim
- c) The stove is turned to low heat
- d) It is both burning and not burning

Q4. The statement 'Every even integer greater than 2 is a sum of two prime numbers' is:

- a) theorem
- b) conjecture
- c) axiom
- d) postulate

Q5. The contrapositive of $p \rightarrow q$ is:

- a) $q \rightarrow p$
- b) $\sim q \rightarrow p$
- c) $\sim p \rightarrow \sim q$
- d) $\sim q \rightarrow \sim p$

Part B: Short Questions (2 marks each)

Q1. Define: Define logical conjunction.

Q2. Show that if x is odd, then $x^2 - 4x + 6$ is odd.

Q3. Write a simple deductive proof for: $(4 + 16x)/4 = 1 + 4x$

Q4. Differentiate between a mathematical statement and a proof with examples.

Q5. Determine whether the statement 'There is exactly one straight line through any two points' is axiom, theorem or conjecture.

Part C: Long Question (5 marks)

Q1. Prove: For any two non-empty sets A and B, $(A \cap B)' = A' \cup B'$

Logic - Unit No. 8 Test # 3

Time: 30 Minutes

Total Marks: 20

Part A: Multiple Choice Questions (1 mark each)

Q1. Negation of 'The stove is burning' is:

- a) The stove is not burning
- b) The stove is dim
- c) The stove is turned to low heat
- d) It is both burning and not burning

Q2. The statement 'Every even integer greater than 2 is a sum of two prime numbers' is:

- a) theorem
- b) conjecture
- c) axiom
- d) postulate

Q3. Which of the following expressions is often related to inductive reasoning?

- a) based on repeated experiments
- b) if and only if statements
- c) Statement is proven by a theorem
- d) based on general principles

Q4. A conditional is false only when:

- a) antecedent is true and consequent is false
- b) consequent is true and antecedent is false
- c) antecedent is true only
- d) consequent is false only

Q5. The conjunction of two statements p and q is true when:

- a) both p and q are false
- b) both p and q are true
- c) only q is true
- d) only p is true

Part B: Short Questions (2 marks each)

Q1. Define: Define conditional statement.

Q2. Write a simple deductive proof for: $(4 + 16x)/4 = 1 + 4x$

Q3. Differentiate between a mathematical statement and a proof with examples.

Q4. Prove: $(x + 5)^2 - (x - 5)^2 = 20x$

Q5. Show that if x is odd, then $x^2 - 4x + 6$ is odd.

Part C: Long Question (5 marks)

Q1. Show that $(x^2 + 7x + 10)/(x^2 - 3x - 10) = (x + 5)/(x - 5)$ using factorization