

SATISH CHANDRA MEMORAL SCHOOL

CH-9 EXTRA QUESTIONS

1. Consider the proposition (P): 'If a quadrilateral has diagonals that bisect each other at right angles, then it is a square.' Which of the following is true regarding (P) and its converse (Q)?

- A) Both (P) and (Q) are true statements.
- B) (P) is false, but its converse (Q) is true.
- C) (P) is true, but its converse (Q) is false.
- D) Both (P) and (Q) are false statements

2. What is the converse of the proposition: "If a number is a multiple of 6, then it is a multiple of 3"?

- A) If a number is a multiple of 3, then it is a multiple of 6.
- B) If a number is not a multiple of 6, then it is not a multiple of 3.
- C) If a number is a multiple of 3, then it is not a multiple of 6.
- D) If a number is not a multiple of 3, then it is a multiple of 6

3. Consider the statement: "If a quadrilateral is a square, then its diagonals are equal." What is its converse?

- A) If the diagonals of a quadrilateral are equal, then it is a square.
- B) If the diagonals of a quadrilateral are not equal, then it is not a square.
- C) If a quadrilateral is not a square, then its diagonals are not equal.
- D) If the diagonals of a quadrilateral are equal, then it is a rectangle.

4. Consider the proposition: "If n is a prime number greater than 2, then n is odd." What is its converse?

- A) If n is odd, then n is a prime number greater than 2.
- B) If n is even, then n is not a prime number.
- C) If n is not odd, then n is not a prime number greater than 2.
- D) If n is a prime number, then $n > 2$.

5. **Assertion (A):** The converse of "If a number is prime, then it is odd" is false.

Reason (R): 2 is a prime number, but it is even.

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

6. Assertion (A): If the sum of any two opposite angles of a quadrilateral is 180° , then the quadrilateral is cyclic.

Reason (R): The converse of the statement 'Opposite angles of a cyclic quadrilateral are supplementary' is mathematically valid.

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

7. Proposition: "If a number is the square of an integer, then it has an odd number of factors."

Question: What is the converse? Is it true?

8. Prove or disprove with a counterexample the converse of: "If $a^2 = b^2$, then $a = b$ where a and b are real numbers."

9. Formulate the proposition regarding the property of an isosceles triangle's base angles. Write its converse. Then, prove the converse statement: 'If two angles of a triangle are equal, then the sides opposite to them are equal.'

10. An architectural structural engineer is reviewing quadrilateral trusses for an earthquake-resistant framework. A specific configuration requires a strict conditional implication: 'If a quadrilateral is a parallelogram, then its opposite angles are equal.' The quality control board asks for a deep evaluation of its converse under dynamic loading scenarios.

- a) Write down the formal converse proposition of the engineer's conditional implication statement.
- b) Prove whether this converse proposition is mathematically true or false. Provide structural reasoning.