Important Assertion Reason Questions on Arithmetic Progression

Directions: In the following questions a statement of assertion (A) is followed by a statement of reason(R). Mark the correct choice as:

Choose the correct option for the following questions:

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

Question 1:

Assertion (A): A sequence in which the difference between consecutive terms remains constant is called an Arithmetic Progression (AP).

Reason (R): The constant difference in an AP is called the common difference.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 2:

Assertion (A): The sequence 2,5,8,11,142, 5, 8, 11, 142,5,8,11,14 is an AP.

Reason (R): The difference between consecutive terms is 3.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 3:

Assertion (A): The nth term of an AP is given by:

dan=a+(n−1)d

Reason (R): Here, aaa is the first term and ddd is the common difference.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 4:

Assertion (A): The sequence 7,7,7,77, 7, 7, 77,7,7,7 is an AP.

Reason (R): The common difference of the sequence is 0.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 5:

Assertion (A): The 10th term of the AP 3,6,9,12,... is 30.

Reason (R): For this AP,a=3 and d=3

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

a10=3+(10−1)×3=30

Question 6:

Assertion (A): The sum of the first nnn terms of an AP is given by:

$S_n = \frac{n}{2}[2a + (n-1)d]$

Reason (R): The formula depends on the first term, common difference, and number of terms.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 7:

Assertion (A): The sequence 1,4,9,16,25 is an AP.

Reason (R): The difference between consecutive terms is not constant.

Options:

(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.

Correct Answer: (D). A is false, but R is true.

Question 8:

Assertion (A): If the common difference of an AP is positive, the sequence increases.

Reason (R): Each term becomes greater than the previous term.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 9:

Assertion (A): The common difference of the AP 15,10,5,0,−5 is -5.

Reason (R): The common difference is found by subtracting a term from the next term.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 10:

Assertion (A): The AP 5,8,11,14,... has common difference 3.

Reason (R): The difference between any two consecutive terms is constant.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 11:

Assertion (A): The nth term of an AP depends on the common difference.

Reason (R): Changing the common difference changes the sequence.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 12:

Assertion (A): The sum of the first 5 natural numbers is 15.

Reason (R): Natural numbers form an AP with first term 1 and common difference 1.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

1+2+3+4+5=15

Question 13:

Assertion (A): An AP can have negative terms.

Reason (R): The common difference of an AP can be negative.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 14:

Assertion (A): The sequence 20,17,14,11,8 is a decreasing AP.

Reason (R): Its common difference is negative.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 15:

Assertion (A): The formula for the nth term helps find any term without writing the whole AP.

Reason (R): The nth term formula directly gives the required term number.

Options:

(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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.