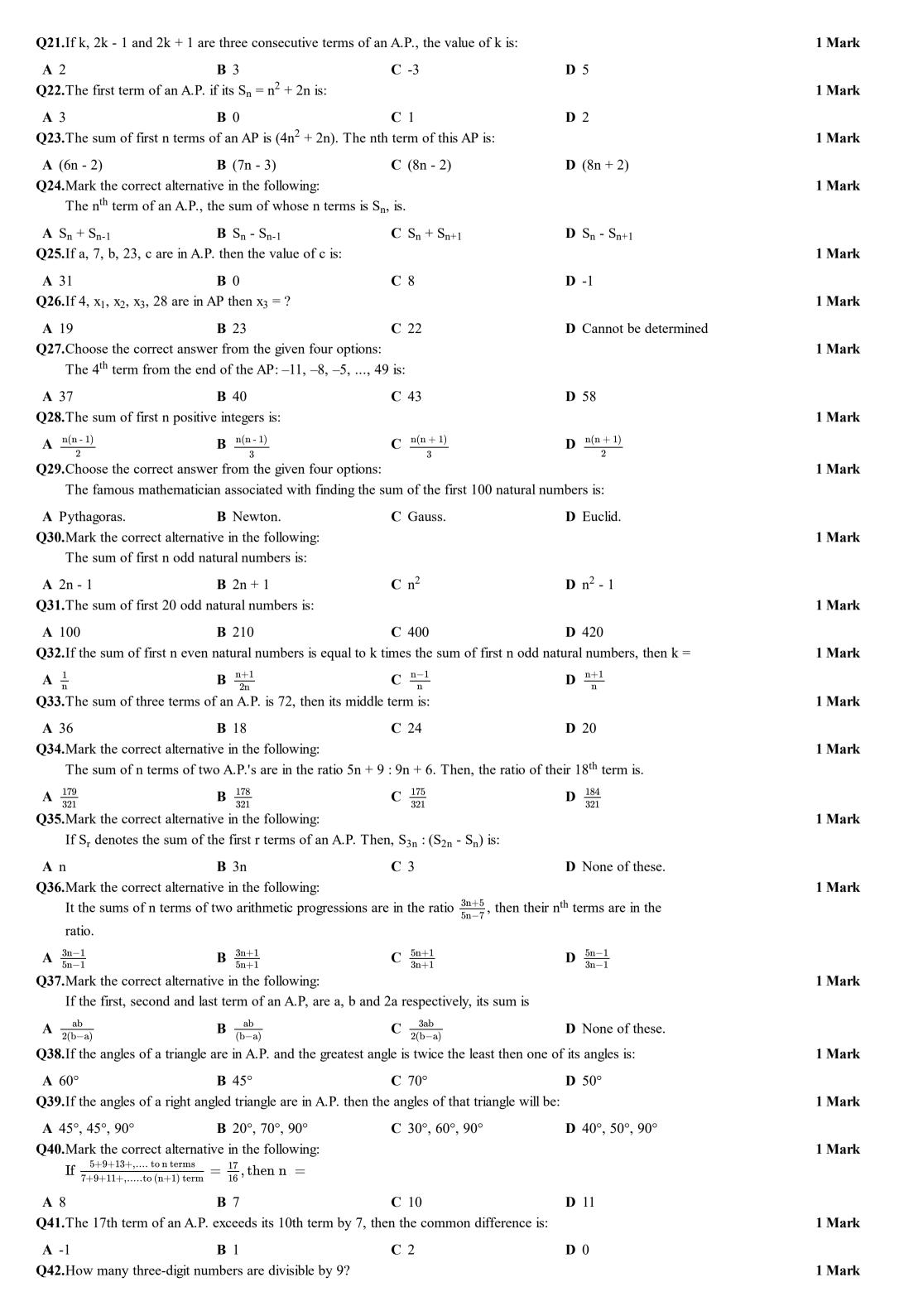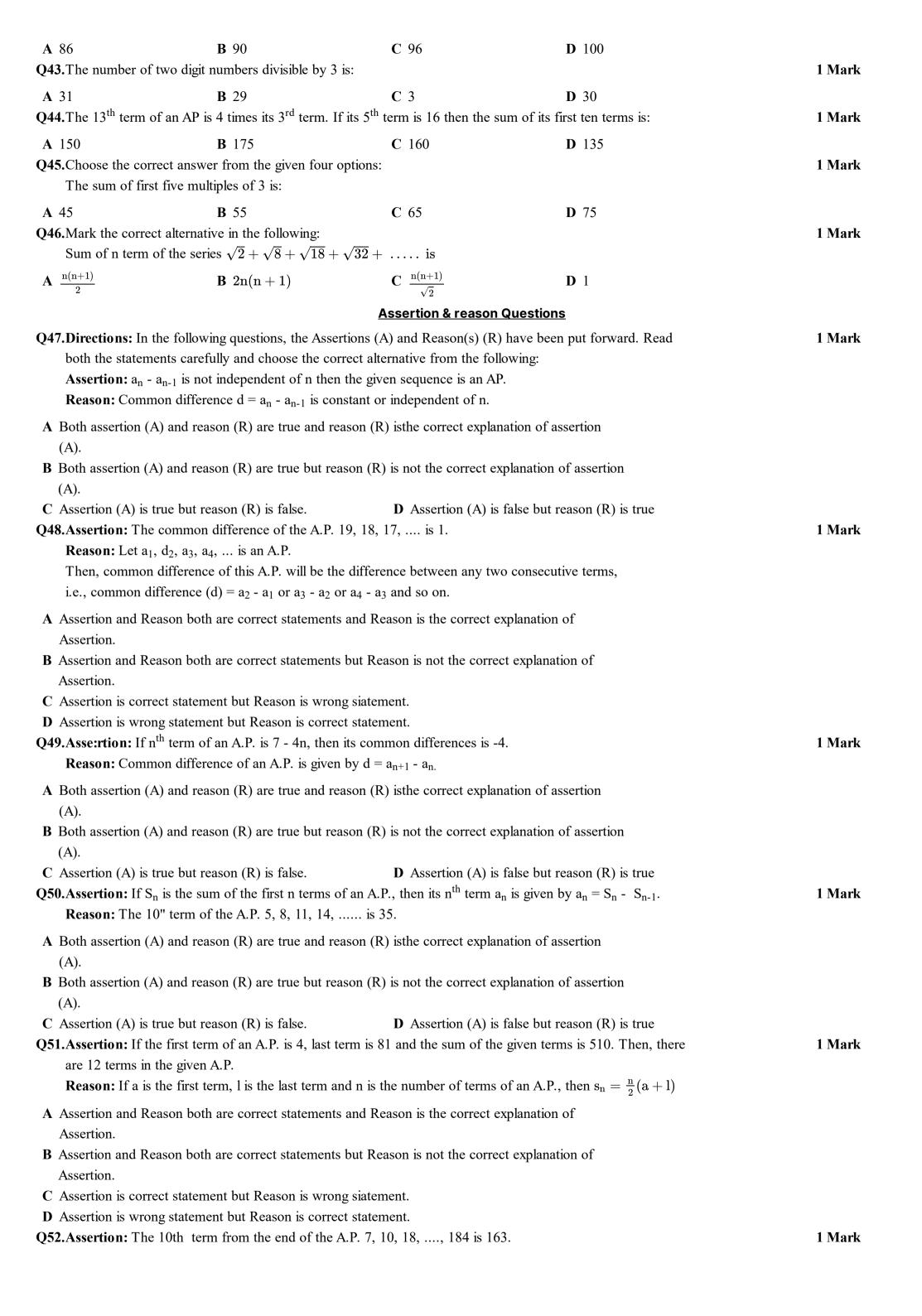# ARITHMETIC PROGRESSIONS

MCQs & A and R WORK SHEET

Test / Exam Name: Arithmetic Progression   **Standard:** 10th   **Subject:** Mathematics

Student Name: ....   **Section:** ....   **Roll No.:** ....

| Questions: 58 | Time: 02:00 hh:mm | Negative Marks: 0 | Marks: 58 |

Instructions

1. MULTIPLE CHOICE QUESTIONS.

Q1. Which of the following is not an A.P.?   **1 Mark**

A -1.2, -3.2, -5.2, -7.2, ...   **B** a, 2a, 3a, 4a, ...   **C** 2, 4, 8, 16, ...   **D** 2, 5252, 3, 7272, ...

Q2. In an A.P. if a = 3.5, d = 0 and n = 101, then a_n =   **1 Mark**

A 0   **B** 103.5   **C** 3.5   **D** 1

Q3. In an A.P. if d = -4, n = 7 and an = 4, then 'a' is: **1 Mark**

A 20   **B** 6   **C** 28   **D** 7

Q4. The first term of an AP is p and the common difference is q, then its 10th term is: **1 Mark**

A q + 9p.   **B** p - 9q.   **C** p + 9q.   **D** 2p + 9q.

Q5. The nth term of the A.P. a, 3a, 5a, ___ is.   **1 Mark**

A na   **B** $(2n - 1)$ a   **C** $(2n + 1)$ a   **D** 2na

Q6. The 10th term of an A.P. 2, 7, 12, ... is: **1 Mark**

A 49   **B** 50   **C** 48   **D** 47

Q7. What is 20th term from the end of the AP 3, 8, 13, ..., 253?   **1 Mark**

A 163   **B** 158   **C** 153   **D** 148

Q8. The first three terms of an AP respectively are 3y - 1, 3y + 5 and 5y + 1. Then y equals: **1 Mark**

A -3   **B** 4   **C** 5   **D** 2

Q9. What is the common difference of an AP in which a_{18} - a_{14} = 32?   **1 Mark**

A 8   **B** -8   **C** 4   **D** -4

Q10. Which term of the AP 72, 63 54, ...is 0?   **1 Mark**

A 8th **B** 9th **C** 10th **D** 11th

Q11. Choose the correct answer from the given four options: **1 Mark**

If the common difference of an AP is 5, then what is $a_{18} - a_{13}$?

A 5   **B** 20   **C** 25   **D** 30

Q12. The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}. \frac{1-2p}{p}.........$ is :   **1 Mark**

A P   **B** -P   **C** -1   **D** 1

Q13. The common difference of the AP $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}, ...$ is: **1 Mark**

A $\frac{1}{3}$ **B** $\frac{-1}{3}$ **C** b   **D** $-b$

Q14. Mark the correct alternative in the following: **1 Mark**

If 18th and 11th term of an A.P. are in the ratio 3 : 2, then its 21st and 5th terms are in the ratio:

A 3 : 2   **B** 3 : 1   **C** 1 : 3   **D** 2 : 3

Q15. The 31st term of an A.P. whose first two terms are -3 and 4 is: **1 Mark**

A 210   **B** 200   **C** 137   **D** 207

Q16. The sum of first 16 terms of the AP 10, 6, 2, ... is.   **1 Mark**

A 320   **B** -320   **C** -352   **D** -400

Q17. The common difference of the A.P whose $S_n = 3n_2 + 7n$ is: **1 Mark**

A 5   **B** 1   **C** 2   **D** 6

Q18. The 9th term of an A.P. is 499 and the 499th term is 9. The term which is equal to zero is: **1 Mark**

A 504th term   **B** 510th term   **C** 500th term   **D** 508th term

Q19. Which term of the AP 25, 20, 15,....is the first negative term?   **1 Mark**

A 10th **B** 9th **C** 8th **D** 7th

Q20. An AP 5, 12, 19, ...has 50 term. Its last term is: **1 Mark**

A 343   **B** 353   **C** 348   **D** 362

Q21. If k, 2k - 1 and 2k + 1 are three consecutive terms of an A.P., the value of k is: **1 Mark**

A 2   **B** 3   **C** -3   **D** 5

Q22. The first term of an A.P. if its $S_n = n^2 + 2n$ is: **1 Mark**

A 3   **B** 0   **C** 1   **D** 2

Q23. The sum of first n terms of an AP is $(4n^2 + 2n)$. The nth term of this AP is: **1 Mark**

A (6n - 2)   **B** (7n - 3)   **C** (8n - 2)   **D** (8n + 2)

Q24. Mark the correct alternative in the following: **1 Mark**

The nth term of an A.P., the sum of whose n terms is S_n, is.

A $S_n + S_{n-1}$ **B** $S_n - S_{n-1}$ **C** $S_n + S_{n+1}$ **D** $S_n - S_{n+1}$

Q25. If a, 7, b, 23, c are in A.P. then the value of c is: **1 Mark**

A 31   **B** 0   **C** 8   **D** -1

Q26. If 4, x_1, x_2, x_3, 28 are in AP then $x_3 = $? **1 Mark**

A 19   **B** 23   **C** 22   **D** Cannot be determined

Q27. Choose the correct answer from the given four options: **1 Mark**

The 4th term from the end of the AP: –11, –8, –5, ..., 49 is:

A 37   **B** 40   **C** 43   **D** 58

Q28. The sum of first n positive integers is: **1 Mark**

A $\frac{n(n-1)}{2}$ **B** $\frac{n(n-1)}{3}$ **C** $\frac{n(n+1)}{3}$ **D** $\frac{n(n+1)}{2}$

Q29. Choose the correct answer from the given four options: **1 Mark**

The famous mathematician associated with finding the sum of the first 100 natural numbers is:

A Pythagoras.   **B** Newton.   **C** Gauss.   **D** Euclid.

Q30. Mark the correct alternative in the following: **1 Mark**

The sum of first n odd natural numbers is:

A 2n - 1   **B** 2n + 1   **C** n^2 **D** $n^2 - 1$

Q31. The sum of first 20 odd natural numbers is: **1 Mark**

A 100   **B** 210   **C** 400   **D** 420

Q32. If the sum of first n even natural numbers is equal to k times the sum of first n odd natural numbers, then k = **1 Mark**

A $\frac{1}{n}$ **B** $\frac{n+1}{2n}$ **C** $\frac{n-1}{n}$ **D** $\frac{n+1}{n}$

Q33. The sum of three terms of an A.P. is 72, then its middle term is: **1 Mark**

A 36   **B** 18   **C** 24   **D** 20

Q34. Mark the correct alternative in the following: **1 Mark**

The sum of n terms of two A.P.'s are in the ratio 5n + 9 : 9n + 6. Then, the ratio of their 18th term is.

A $\frac{179}{321}$ **B** $\frac{178}{321}$ **C** $\frac{175}{321}$ **D** $\frac{184}{321}$

Q35. Mark the correct alternative in the following: **1 Mark**

If S_r denotes the sum of the first r terms of an A.P. Then, $S_{3n} : (S_{2n} - S_n)$ is:

A n   **B** 3n   **C** 3   **D** None of these.

Q36. Mark the correct alternative in the following: **1 Mark**

It the sums of n terms of two arithmetic progressions are in the ratio $\frac{3n+5}{5n-7}$, then their n^{th} terms are in the ratio.

A $\frac{3n-1}{5n-1}$ **B** $\frac{3n+1}{5n+1}$ **C** $\frac{5n+1}{3n+1}$ **D** $\frac{5n-1}{3n-1}$

Q37. Mark the correct alternative in the following: **1 Mark**

If the first, second and last term of an A.P, are a, b and 2a respectively, its sum is

A $\frac{ab}{2(b-a)}$ **B** $\frac{ab}{(b-a)}$ **C** $\frac{3ab}{2(b-a)}$ **D** None of these.

Q38. If the angles of a triangle are in A.P. and the greatest angle is twice the least then one of its angles is: **1 Mark**

A 60°   **B** 45°   **C** 70°   **D** 50°

Q39. If the angles of a right angled triangle are in A.P. then the angles of that triangle will be: **1 Mark**

A 45°, 45°, 90°   **B** 20°, 70°, 90°   **C** 30°, 60°, 90°   **D** 40°, 50°, 90°

Q40. Mark the correct alternative in the following: **1 Mark**

If $\frac{5+9+13+,.... \text{ to n terms}}{7+9+11+,.....\text{to (n+1) term}} = \frac{17}{16}$, then n =

A 8   **B** 7   **C** 10   **D** 11

Q41. The 17th term of an A.P. exceeds its 10th term by 7, then the common difference is: **1 Mark**

A -1   **B** 1   **C** 2   **D** 0

Q42. How many three-digit numbers are divisible by 9? **1 Mark**

A 86   **B** 90   **C** 96   **D** 100

Q43. The number of two digit numbers divisible by 3 is: **1 Mark**

A 31   **B** 29   **C** 3   **D** 30

Q44. The 13th term of an AP is 4 times its 3rd term. If its 5th term is 16 then the sum of its first ten terms is: **1 Mark**

A 150   **B** 175   **C** 160   **D** 135

Q45. Choose the correct answer from the given four options: **1 Mark**

The sum of first five multiples of 3 is:

A 45   **B** 55   **C** 65   **D** 75

Q46. Mark the correct alternative in the following: **1 Mark**

Sum of n term of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \ldots\ldots$ is

A $\dfrac{n(n+1)}{2}$ **B** $2n(n+1)$ **C** $\dfrac{n(n+1)}{\sqrt{2}}$ **D** 1

Assertion & reason Questions

Q47. Directions: In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion: $a_n - a_{n-1}$ is not independent of n then the given sequence is an AP.

Reason: Common difference $d = a_n - a_{n-1}$ is constant or independent of n.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q48. Assertion: The common difference of the A.P. 19, 18, 17, ... is 1.   **1 Mark**

Reason: Let a_1, d_2, a_3, a_4, ... is an A.P.

Then, common difference of this A.P. will be the difference between any two consecutive terms, i.e., common difference (d) = $a_2 - a_1$ or $a_3 - a_2$ or $a_4 - a_3$ and so on.

A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

C Assertion is correct statement but Reason is wrong siatement.

D Assertion is wrong statement but Reason is correct statement.

Q49. Asse:rtion: If n^{th} term of an A.P. is 7 - 4n, then its common differences is -4.   **1 Mark**

Reason: Common difference of an A.P. is given by $d = a_{n+1} - a_n$.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q50. Assertion: If S_n is the sum of the first n terms of an A.P., then its nth term a_n is given by $a_n = S_n - S_{n-1}$.   **1 Mark**

Reason: The 10" term of the A.P. 5, 8, 11, 14, ... is 35.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q51. Assertion: If the first term of an A.P. is 4, last term is 81 and the sum of the given terms is 510. Then, there are 12 terms in the given A.P.   **1 Mark**

Reason: If a is the first term, l is the last term and n is the number of terms of an A.P., then $s_n = \frac{n}{2}(a + l)$

A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

C Assertion is correct statement but Reason is wrong siatement.

D Assertion is wrong statement but Reason is correct statement.

Q52. Assertion: The 10th term from the end of the A.P. 7, 10, 18, ..., 184 is 163.   **1 Mark**

Reason: In an A.P. with first term a, common difference d and last term l, the nth term from the end is $l - (n - 1)d$.

  A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

  B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

  C Assertion is correct statement but Reason is wrong siatement.

  D Assertion is wrong statement but Reason is correct statement.

Q53.Assertion: The n' term of a sequence is 3n - 2. It is an A.P.   **1 Mark**

    Reason: A sequence is not an A.P. ifitsn is not a linear expression in n.

  A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

  B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

  C Assertion is correct statement but Reason is wrong siatement.

  D Assertion is wrong statement but Reason is correct statement.

Q54.Assertion: Arithmetic between 8 and 12 is 10.   **1 Mark**

    Reason: Arithmetic between two numbers 'a' and 'b' is given as $\frac{a+b}{2}$.

  A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q55.Assertion: The sum of the series with the nth term. $t_n = (9 - 5n)$ is (465), when no. of terms n = 15.   **1 Mark**

    Reason: Given series is in A.P. and sum of n terms of an A.P. is $s_n = \frac{n}{2}[2a + (n-1)d]$

  A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q56.Assertion : Sum of first 10 terms of the arithmetic progression -0.5, -1.0, -1.5, ... is 27.5   **1 Mark**

    Reason : Sum of n terms of an A.P. is given as $s_n = \frac{n}{2}[2a + (n-1)d]$ where a = first term, d = common difference.

  A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q57.Assertion: Common difference of an AP in which $a_{21} - a_7 = 84$ is 14.   **1 Mark**

    Reason: n th term of AP is given by $a_n = a + (n - 1)d$

  A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true

Q58.Assertion: Three consecutive terms 2k + 1, 3k + 3 and 5k - 1 form an AP than & is equal to 6.   **1 Mark**

    Reason: In an AP a, a + d, a + 2d,....., n terms of the AP be $s_n = \frac{n}{2}(2a + (n-1)d)$

  A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true