Name of the Bundle	Intermediate Bundle V1	Subject	Aptitude
Topic	Series and Progression	Last updated on	10 October 2024

CONCEPT 1 – ARITHMETIC PROGRESSION

1.To find n,Tn,d,a.

1) Jack is a fitness freak. He started practicing by doing 10 push-ups on his first day. Every day, he did 5 more push-ups than the previous day. How many push-ups did he do on the last day of the first week?

  a) 25
  b) 35
  c) 40
  d) 50

ANS: c) 40

Explanation:

$$T_n = a + (n-1)\ d$$

T_n — n^{th} term or Last term.

a — First term.

n — number of terms.

d — common difference.

$T_7 = 10 + (7-1)5$
$T_7 = 40.$

2) Find the 17th term of the A.P. 4,9,14,......

    a) 84
    b) 82
    c) 79
    d) 87

ANS: a) 84

Explanation:

$$T_{17} = 4 + (17\text{-}1)5$$
$$T_{17} = 84.$$

3) Which term of the arithmetic progression 2, 6, 10,..... is 126?

    a) 38
    b) 43
    c) 32
    d) 52

ANS: c) 32

Explanation:

$$T_n = 126 = 2 + (n\text{-}1)4$$
$$n - 1 = 124 / 4 = 31$$
$$n = 32.$$

![Selvam College of Technology logo]

Selvam College of Technology

An Autonomous Institution

Accredited by NAAC with "A" Grade, UGC Recognized 2(f) Status,
An ISO 9001:2015 Certified Institution, Approved by AICTE New Delhi, Affiliated to Anna University-Chennai
PONNUSAMY NAGAR, SALEM ROAD(NH-44), NAMAKKAL-637003. TAMILNADU.
Mobile: 9942099122, 9942099109, Web: www.selvamtech.edu.in

Name of the Bundle	Intermediate Bundle V1	Subject	Aptitude
Topic	Series and Progression	Last updated on	10 October 2024

4) A man has saved ₹640 during the first month, ₹720 in the second month and ₹800 in the third month. If he continues his saving in this sequence what will be his savings in the 25th month?

    a) ₹ 2560
    b) ₹ 2620
    c) ₹ 4675
    d) ₹5175

ANS: a) ₹ 2560

Explanation:

$$T_{25} = 640 + (25 - 1)\,80$$
$$T_{25} = 2560.$$

5) A taxi charges ₹2 for the first mile and ₹1.5 for each subsequent mile. How much does Katie need to pay to the taxi driver if she travels 5 miles?

    a) 5
    b) 6
    c) 7
    d) 8

ANS: d) 8

Explanation:

$$T_5 = 2 + (5 - 1)\,1.5$$
$$T_5 = 8.$$

6) Find the number of terms in the given sequence 7,13,19,………205.

   a) 33
   b) 34
   c) 36
   d) 35

ANS: b)34

Explanation:

$$T_n = 205 = 7 + (n-1)6$$
$$n - 1 = 198 / 7 = 33$$
$$n = 34.$$

2.To find the sum of terms.

7) Find the sum of 7+14+21+……….+490.

   a) 16395
   b) 17295
   c) 17395
   d) 17495

ANS: c) 17395

Explanation:

$$T_n = 490 = 7 + (n-1)7$$
$$n - 1 = 483 / 7 = 69$$
$$n = 70.$$

$$S_n = \frac{n\,(a+l)}{2}$$

$$S_n = \frac{70\,(7+490)}{2}$$

$$S_n = 17395$$

IT Support and Development Training Programme
Creating Employable Engineers and Entrepreneurs

8) Find the sum of 5+11+17+……….+95.

    a) 760
    b) 780
    c) 840
    d) 800

ANS:d) 800

Explanation:

$$T_n = 95 = 5 + (n-1)6$$
$$n - 1 = 90 / 6 = 15$$
$$n = 16.$$

$$S_n = \frac{n\,(a+l)}{2}$$

$$S_n = \frac{16\,(5+95)}{2}$$

$$S_n = 800$$

3.To find Arithmetic mean.

9) Find the Arithmetic mean of the following series: 5,10,15, 20, 25

 a) 5
 b) 15
 c) 20
 d) 10

ANS: b) 15

Explanation:

Case 1: Number of terms is Odd, Middle most term will be the Arithmetic mean.

Here, n = 5, which is odd.

Therefore, 15 will be the arithmetic mean.

10) Find the Arithmetic mean of the following series: 10,15, 20, 25

 a) 16.5
 b) 15
 c) 17.5
 d) 20

ANS: c) 17.5

Explanation:

Case 1: Number of terms is Even, (a+l)/2 will be the Arithmetic mean.

Here, n = 4, which is even.

Therefore, **(10+25)/2 = 17.5** will be the arithmetic mean.

CONCEPT 2 – GEOMETRIC PROGRESSION

11) Hailey's teacher asks her to find the 10th term of the sequence:

1, 4, 16, 64, ...Can you help her?

a) 4^{10}
b) 4^{9}
c) 4^{11}
d) 4^{8}

ANS: b) 4^{9}

Explanation:

$$T_n = ar^{n-1}$$

T_n — n^{th} term or last term.

a — First term.

r — Common ratio.

n — number of terms.

$$T_{10} = 1 * 4^{(10-1)}$$
$$T_{10} = 4^{9}$$

12) Find the sum of infinite terms of the series 70, 35, 17.5, ...

   a) 150
   b) 145
   c) 190
   d) 140

ANS: d) 140

Explanation:

Condition:

1.Series should have infinite terms.

2.r must be less than 1.

$$S_n = \frac{a}{1-r}$$

$$S_n = \frac{70}{1-0.5}$$

$$S_n = 140.$$

Name of the Bundle	Intermediate Bundle V1	Subject	Aptitude
Topic	Series and Progression	Last updated on	10 October 2024

13) Find the sum of infinite terms of the series 54, 18, 6, 2,....

   a) 100
   b) 90
   c) 81
   d) 71

ANS: c) 81

Explanation:

$$S_n = \frac{a}{1-r}$$

$$S_n = \frac{54}{1-(1/3)}$$

$$S_n = 81.$$

14) Find the 3rd term of the geometric progression whose first term is 6 and common ratio is 2.

    a) 25
    b) 30
    c) 24
    d) 45

ANS: c) 24

Explanation:

15) Find the Geometric mean of the following series: 4,8,16.

    a) 4
    b) 8
    c) 16
    d) 20

   ANS: b) 8

Explanation:

Case 1: Number of terms is Odd, Middle most term will be the Geometric mean.

Here, n = 3, which is odd.

Therefore, 8 will be the geometric mean.

16) Find the Geometric mean of the following series: 4, 8, 16, 32.

    a) 8
    b) 16√2
    c) 8√2
    d) 32√2

ANS: c) 8√2

Explanation:

Case 1: Number of terms is Even, √al will be the Geometric mean.

Here, n = 4, which is even.

Therefore, **√4*32 = 8√2** will be the geometric mean.

17) If the geometric mean of 16 and y is 12. Find the value of y.

    a) 3
    b) 6
    c) 9
    d) 12

ANS: c) 9

Explanation:

Geometric mean = √16*y = 12.

y = 9

CONCEPT 3 – HARMONIC PROGRESSION

18) If 1/2, 1/x, 1/8 are in H.P, then what is the value of x?

    a) 3
    b) 4
    c) 8
    d) 5

ANS: d) 5

Explanation:

- **The Harmonic Progression series is the reciprocal of the Arithmetic Progression series.**
- **If 1/2, 1/x, 1/8 are in H.P, then 2, x, 8 are in A.P.**

- **2d = 6; d = 3.**
- **x = 2+3 = 5.**

19) Find the Harmonic mean of the following series: 1/3, 1/7, 1/11.

    a) 3
    b) 7
    c) 11
    d) 6

ANS: b) 7

Explanation:

- **The Harmonic Progression series is the reciprocal of the Arithmetic Progression series.**
- **If 1/3, 1/7, 1/11 are in H.P, then 3, 7, 11 are in A.P.**

Here, n = 3, which is odd.

Therefore, 7 will be the arithmetic mean.

IT Support and Development Training Programme
Creating Employable Engineers and Entrepreneurs

20) Find the Arithmetic mean, if Geometric mean is 6 and Harmonic mean is 9.

a) 9
b) 16
c) 36
d) 4

ANS: d) 4

Explanation:

$$AM * HM = GM^2$$

$$AM * 9 = 36$$

$$AM = 4.$$

21)Look at the pattern shown below.Observe that each square is half of the size of the square next to it. Which sequence does this pattern represent?

$$1, 1/2, 1/4, 1/8…..$$

a) 0.5
b) 1.75
c) 2
d) 1/128

ANS: a) 0.5

Explanation:

$$r = 0.5$$

Selvam College of Technology

An Autonomous Institution

Accredited by NAAC with "A" Grade, UGC Recognized 2(f) Status,
An ISO 9001:2015 Certified Institution, Approved by AICTE New Delhi, Affiliated to Anna University-Chennai
PONNUSAMY NAGAR, SALEM ROAD(NH-44), NAMAKKAL-637003. TAMILNADU.
Mobile: 9942099122, 9942099109, Web: www.selvamtech.edu.in

Name of the Bundle	Intermediate Bundle V1	Subject	Aptitude
Topic	Series and Progression	Last updated on	10 October 2024

CONCEPT 4 – GENERAL SERIES AND PROGRESSION

22) Calculate the sum of the first 50 natural numbers.

   a) 1275
   b) 1500
   c) 1375
   d) 1480

ANS: a) 1275

Explanation:

Sum of first n natural numbers:

$$S_n = \frac{n(n+1)}{2} \quad ; \quad S_n = \frac{50(50+1)}{2}$$

S_n = **1275**

23)Find the sum of squares of the first 20 natural numbers.

   a) 3500
   b) 2870
   c) 4569
   d) 1875

ANS: b) 2870

Explanation:

Sum of squares of first n natural numbers:

$$S_n = \frac{n(n+1)(2n+1)}{6} \quad ; \quad S_n = \frac{20(20+1)(40+1)}{6}$$

S_n = **2870**

IT Support and Development Training Programme
Creating Employable Engineers and Entrepreneurs

24) Calculate the sum of the cubes of the first 10 natural numbers.

    a) 4580
    b) 7856
    c) 2800
    d) 3025

ANS: d) 3025

Explanation:

Sum of cubes of first n natural numbers:

$$S_n = \left(\frac{n(n+1)}{2}\right)^2 = (55)^2 = 3025.$$

25) Calculate the sum of odd numbers within 100.

    a) 1275
    b) 2500
    c) 1375
    d) 1480

ANS: b) 2500

Explanation:

Sum of first n odd natural numbers:

$S_n = n^2$

where, n is the number of odd numbers. There are 50 odd numbers within 100.

$S_n = 50^2 = \textbf{2500.}$

IT Support and Development Training Programme
Creating Employable Engineers and Entrepreneurs