GENERAL APTITUDE

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HCF(Poll)

Q. In a school of 437 boys & 342 girls it was decided to divide the girls & boys into separate classes. However it was required that each class consist of the same number of students. What would be the number of classrooms required?

A. 41 classrooms B. 14 classrooms C. 17 classrooms D. 26 classrooms

Ans : A

Same Class Size = HCF (Boys, Girls)

→ HCF (437,342) = 19

→ Boys Classes = 437/19 = 23

→ Girls Classes = 342/19 = 18

→ Total Classes = 23 + 18 = 41

HCF & LCM

Q. The traffic lights at three different road crossings change after every 48 sec,72 sec,108 sec respectively. If they all changes simultaneously at 08:20:00 hours, then at what time they will change again simultaneously?

A. 08:28:12 B. 08:27:12 C. 08:29:00 D. 08:30:00

Ans: B

Traffic Lights Change after 48 sec, 72 sec and 108 sec respectively.

LCM(48, 72, 108) = 432 seconds⇒

LCM(48, 72, 108) = 432 / 60 minutes⇒ LCM(48, 72, 108) = 7 min. 12 sec.

Traffic Lights will Change Together Again=Last Time + LCM Of Time

=(08 : 20 : 00 AM) + (7 min. 12 sec)

=08 : 27 : 12 AM

HCF/LCM with Decimal point

- Find HCF of 1.08, 0.36 and 0.9
- **Soln**:

1. Convert each of the decimals into like decimals.

1.08, 0.36 and 0.90

2. Write each number without decimal point.

HCF(108,36,90) = 18

3. Put decimal point after the numbers which are in like decimals.

Here it is after 2 numbers(digits)

HCF (1.08, 0.36 and 0.90) = 0.18

Rules to Remember

- **Fractions :**

LCM = LCM of Numerators / HCF of Denominators

HCF = HCF of Numerators / LCM of Denominators

LCM of 25/12 & 35/18

LCM = 175/6

HCF of 25/12 & 35/18

HCF = 5/36

HCF & LCM Fractions(Assignment)

- Find HCF & LCM of 5/9 and 25/36
- Ans : HCF = 5/36 and LCM = 25/9

Properties of Square Numbers

- A square can’t end with odd number of zeroes. The number of 0’s of perfect square is always even and the non-zero part should also be a perfect square.

- A square can’t end with 2, 3, 7 or 8.

  1 2 3 4 5

  6 7 8 9 0

- Square of odd no. is odd & even no. is even

- Whenever last digit of square is 6, then second last digit is always odd.
- Whenever last digit of square is 5, then second last digit is always 2.
- Whenever last digit of square is 1,4,9, then second last digit is always even.

Squares

Q. A man plants his orchard with 15876 trees & arranges them so that there are as many rows as there are trees in each row. How many rows does the orchard have?

A. 124 B. 134 C. 126 D. 136

- **Soln:-**
- No of trees = No. of rows x no of trees/row
- 15876 = n x n
- n = √15876
- n = √9 x 1764
- = √9 x 9 x 196
  = ?
  = 9 x 14
  =126
- **Ans C**

Squares(Assignment)

Q. Find a positive number x, such that the difference between the square of this number and 21 is the same as the product of 4 times the number?

A. 9 B. 27 C. 7 D. 13

Ans : C

Progression

- **Arithmetic Progression :**
- If quantities increase or decrease by a common difference then they are said to be in AP e.g. 3, 5, 7, 9,11,….
- If a is first term, d is the common difference, l is the last term then
- General form : a, a+d, a+2d, a+3d,…,a+(n-1)d
- n^{th} term Tn = a + (n-1)d , **n = 1, 2, ..**
- Sum of first n terms $Sn = \frac{n}{2}[2a + (n-1)d]$

$$\mathbf{Sn = \frac{n}{2}(a + l)}$$

Progression

- Prove that the sum Sn of n terms of an Arithmetic Progress (A.P.) whose first term ‘a’ and common difference ‘d’ is
- S = n/2[2a + (n - 1)d]
- Or, S = n/2[a + l], where l = last term = a + (n - 1)d
- **Proof:**
- a , a+d , a+2d , a+3d,…….., a(n-2)d ,a(n-1)d, as l = last term
- a , a+d , a+2d , a+3d,…….., l-d ,l
- S = a + a+d + a+2d + a+3d + …….. + l-d + l ----------1
- Writing equation 1 in reverse order(sum remains same even if we write in reverse order)
- S = l + l-d + l-2d + l-3d + …….. + a+d + a----------2
- Adding equation 1 and 2
- 2S = (a + l) + (a + l) + (a + l) + --------- +(a + l) + (a + l)
- So for n terms,
- 2S = n(a + l)
- S = $\frac{n}{2}$ (a + l)

Progression

Q. The sum of all two digit numbers divisible by 3 is

A. 550 B. 1550 C. 1665 D. 1680

Soln

Two digit numbers divisible by 3 are :

12, 15, 18, 21, ……, 96, 99.

This is an A.P. with a = 12, d = 3, l=99

Let n be the number of terms.

Last term = a + (n-1)d

99 = 12 + (n-1)x3

3n = 90 , n = 30

Sum = n/2 (a + l) = 30/2 x (12+99)

= 1665

Ans: C

Progression

Q. Find the sum of all natural numbers between 10 and 200 which are divisible by 7

A. 2835 B. 2865 C. 2678 D. 2646

Soln:

Two digit numbers divisible by 7 are :

14, 21, 28, 35, ……, , 196.

This is an A.P. with a = 14, d = 7, l=196

Last term = a + (n-1)d

196= 14 + (n-1)x7

196-14 = (n-1)x7

n-1 = 26

n=27

Sum = n/2 (a + l)

= 27/2 x (14+196)

= 27 × 210 /2

= 27 × 105

= 2835

OR

$$n = \frac{\text{LastTerm} - \text{FirstTerm}}{d} + 1$$

Ans: A

Progression(Assignment)

Q. Find the sum of the series 3,8,13,18, ……..,93

A. 912 B. 925 C. 998 D. 936

Ans : A

Progression

- **Geometric Progression** :
- If quantities increase or decrease by a constant factor then they are said to be in GP e.g. 4, 8, 16, 32, …..
- If a is first term, r is the common ratio, then
- General form : a, ar, ar^2, ar^3,……, ar^{n-1}
- n^{th} term Tn = $ar^{(n-1)}$
- Sum of first n terms **Sn** = $\frac{a(r^n - 1)}{(r - 1)}$

Geometric Progression of n terms :

- To prove that the sum of first n terms of the Geometric Progression whose first term ‘a’ and common ratio ‘r’ is given by-
- $S = a + ar + ar^2 + ar^3 + ar^4 + \ldots\ldots\ldots\ldots + ar^{n-1}$ ---------- 1
- Multiply both sides of this equation by r
- $Sr = ar + ar^2 + ar^3 + ar^4 + \ldots\ldots\ldots\ldots + ar^{n-1} + ar^n$ ---------- 2

- - - - - - -

- Eq 2 - Eq 1
- $Sr - S = ar^n - a$
- $S(r - 1) = a(r^n - 1)$
- $S = \frac{a(r^n - 1)}{(r - 1)}$

Geometric Progression

Q. Find the 10^{th} term of the series: 4,16, 64, 256, 1024, ….

A. 4^{10} B. 4^{8} C. 4^{9} D. 1022480

Soln:

The given series is in geometric progression

Where a = 4, r = 4

So $T10 = a \times r^{(10-1)}$

$= 4 \times 4^{(10-1)}$

$= 4^{10}$

Ans: A

Progression

- What is the difference between arithmetic progression and geometric progression?
- A sequence is a set of numbers, called terms, arranged in some particular order. An arithmetic sequence is a sequence with the difference between two consecutive terms constant. The difference is called the common difference. A geometric sequence is a sequence with the ratio between two consecutive terms constant.

Averages

- **Simple Average** :
- An average of a set of values is the sum of values divided by the total number of values.
- Average of ‘n’ values = (Sum of the ‘n’ values)/n
- This is also called as Arithmetic Mean.
- Average (A) = Sum (S)/ Number(n)
- S = A x n
- **Weighted Average** :
- When all values whose average we want to find do not have uniform occurrences we calculate the weighted average.
- If values y1, y2, y3…occur w1, w2, w3… times then
- Weighted Avg $= \frac{(w1y1+w2y2+w3y3+ ..)}{(w1+w2+w3..)}$

Averages

Q. In a class of 50 students, 24 secured 60 in Physics, 16 secured 70 marks and the rest secured 80. What is the average score for Physics in the class?

A.64.8 B. 65.4 C. 67.2 D. 66.7

Soln :-

Students	24	16	10.
Marks	60	70	80

$$\text{Average} = \frac{24\times60 + 16\times70 + 10\times80}{24 + 16 + 10}$$

$$= 3360/50$$

$$= 67.2$$

Ans : C

Averages

- Only For Consecutive Numbers -
- Whenever, we have consecutive numbers or consecutive odd numbers or consecutive even numbers, then always remember the middle number is the Average.
- Examples-
- A. 5,6,7,8,9 → Avg =7
- B. 5,6,7,8 → Avg =6.5
- C. 1,3,5,7,9 → Avg =5
- D. 21,23,25,27 → Avg =24

Averages

Q. The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

A. 48 B. 45 C. 43 D. 44

Ans: D

Averages

Q. The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

Solution 1:-

- Before teacher , total age of students = 22x21
- After teacher is added,

Total age of all students + Age of the teacher =23×22

- Age of the teacher =23×22−22×21

=22(23−21)

=22×2

=44 years

Averages

- The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

- **Solution 2:-**
- New value = old avg + (n $\pm$ 1)(diff)

+ if member added
- If member removed

difference = |Old avg – new avg|

- Where, n = total no. of students

- New value = 21 + (22+1)(1)

  = 21 + 23

  = 44 years

Averages

Q. There are 50 students in a class. Their average weight is 45 kg. When one student leaves the class the average weight reduces by 100 g. What is the weight of the student who left the class ?

A. 45 kg. B. 47.9 kg. C. 49.9 kg. D. 50.1 kg.

Soln:

New value = old avg $\pm$ (n $\mp$ 1)(diff)

= 45 + (50 – 1)(0.1) (as we convert 100g into kg = $\frac{100}{1000}$ = 0.1 kg)

= 45 + 49(0.1)

= 45 + 4.9

= 49.9 kg

Ans: C

Averages

Q. There are 50 students in a class. Their average weight is 45 kg. When one student leaves the class the average weight reduces by 100 g. What is the weight of the student who left the class ?

A. 45 kg. B. 47.9 kg. C. 49.9 kg. D. 50.1 kg.

Soln:

Total weight of 50 students = (45 x 50) kg = 2250 kg

Average weight of 49 students = 45kg -100g = 44.9 kg

So, total weight of 49 students = (44.9 x 49)kg = 2200.1kg

Weight of the students who left the class = 2250 – 2200.1 = 49.9 kg

Ans: C

Averages

Q. The average age of 16 men increases by 3 years when a person 27 years old is replaced by another. How old is the new person?

A.75 B. 30 C. 48 D. 64

Soln:-

- Average of 16 men increases by 3 years means,
- total age increases by 16 x 3 =48
- If the age of new person same as replaced person then there would have been no change in average.
- But average age of 16 men increased by 3 years
- So, total age of the person replacing another person = 27 + 48 = 75years

Ans : A

Averages

Q. The average age of 16 men increases by 3 years when a person 27 years old is replaced by another. How old is the new person?

A.75 B. 30 C. 48 D. 64

Soln:-

Number of men = 16

Let average age be a

→ Total age of 16 men = 16a (Old total)

New average = a+3

→New total age of 16 men = 16 (a+3) = 16a + 48

New Total – Old Total = 48

→ Age of new man = 27 + 48 = 75

Ans : A

Averages

Q. The average age of 8 men is decreased by 2 years when two of them, whose ages are 22 and 28, are replaced by two new men.. What is the average age of two men?

A. 34years B. 30years C. 15years D. 17years

Soln:

- Average of 8 men reduce by 2 years means total age reduces by 16 if two men leave.
- So, the total age of the new men replacing the old men = 22+28–16=34
- => Average = 34/2 = 17 years.

OR

- Total age decreased= (8 * 2) years = 16 years.
- Sum of ages of two new men = (22 + 28 - 16) years = 34 years
- Average age of two new men = (34/2) years = 17 years.
- **Ans: D**

Averages

Q. The average age of students is 7 years and average age of 10 teachers is 50 years. If average age of group of all teachers and students is 8 years. Find the number of students?

A. 420 B. 250 C. 300 D. 270

Soln:

We know, Total = avg x n

	S	T
No.	z	10
Avg	7	50

(student + teacher)x avg = (student) x avg + (teacher) x avg

(z +10) x 8 = (z) x 7 + (10) x 50

8z+80 = 7z + 500

Z= 420 students

Ans :A

Averages(Assignment)

Q. The average age of a class of 39 students is 15 years. If the age of the teacher be included, then the average increases by 3 months. Find the age of the teacher.

A. 20 years B. 25 years C. 30 years D. 27 years

Ans : B

Averages(Assignment)

Q. The average marks of a class of 87 students is 56. When a new student was added and average becomes 56.5. Find marks of new student.

A. 56 B. 44 C. 100 D. 90

Ans: C

Averages(Assignment)

Q. Find the average of first 97 natural numbers.

A. 47 B. 37 C. 48 D. 49 E. 49.5

Ans: D

Averages(Assignment)

Q. The average age of a class of 30 students is 9years. When teacher's age is also added, the average becomes 10. What is the age of the teacher?

A. 41 years B. 40 years C. 39 years D. 42 years

Ans: B

Averages(Assignment)

Q. The average of 50 numbers is 30. If two numbers, 35 and 40 are discarded, then the average of the remaining numbers is nearly:

A. 28.32 B. 29.68 C. 28.78 D. 29.27

Ans: B

Averages(Assignment)

Q. The average age 8 men is increased by 2 years when two of them whose ages are 21 years and 23 years are replaced by two new men . The average age of the two new men is?

A. 22 years B. 24 years C. 28 years D. 30 years

Ans: D

Averages(Assignment)

Q. The average weight of the students of a class is 60 kg. If eight new students of average weight 64 kg join the class, the average weight of the entire class becomes 62 kg. How many students were there in the class initially ?

A. 8 students B. 16 students C.10 students D. 12 students

Ans: A

Averages(Assignment)

Q. The average of ten numbers is 8. If the average of first nine numbers is 7. Find the 10^{th} number?

A. 17 B. 16 C.15 D. 12

Ans: A

Averages(Assignment)

Q. The average marks obtained by 150 students is 30. If the average marks of passed candidates was 40 and that of failed candidates was 20. Find the number of candidates who passed the exam?

A. 25 B. 85 C.75 D. 45

Ans: C

Averages(Assignment)

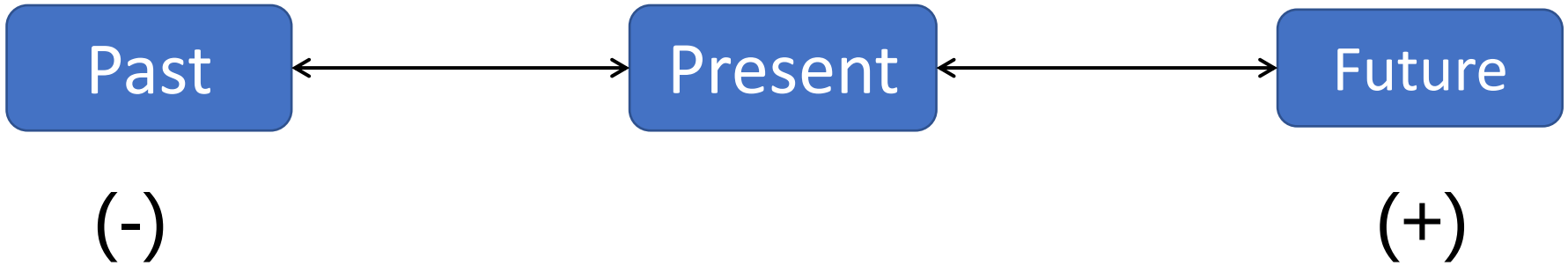
Q. The average expenditure of a man for the first five months is Rs. 3600 and for next seven months is Rs. 3900, if he saves Rs.8700 during the year, his average income per month is ?

A. Rs.4500 B. Rs.8500 C. Rs.7500 D. Rs.5400

Ans: A

Ages

Ram is at present some age(x) . Age 15 years ago or future age, then



‘n’ times of Ram’s age means ,
= n x age

Ages

Q. Karan's age after 15years will be 5 times his age 5 years back. What is the present age of Karan?

A. 12 years B. 10 years C. 20 years D. 25 years

Soln:

Present age = x

As given,

Future age = x +15

Old age = x-5 5 times is that n times

So , x + 15 = 5(x-5)

x +15 = 5x -25

x = 10 years(Karan's present age)

Ans: B

Ages

Q. Present age of Sam & Ana are in the ratio 5:4 respectively. Three years hence ,their ratio will become 11:9 respectively. What is Ana's present age?

A. 6 years B. 24 years C. 28years D. 32years

Soln:

Present age –

S -> 5x, A -> 4x

3 years hence means (+) as its future ratio given and so its fraction

$\frac{5x+3}{4x+3} = \frac{11}{9}$

45x+27 = 44x + 33

x = 6 years

For A,

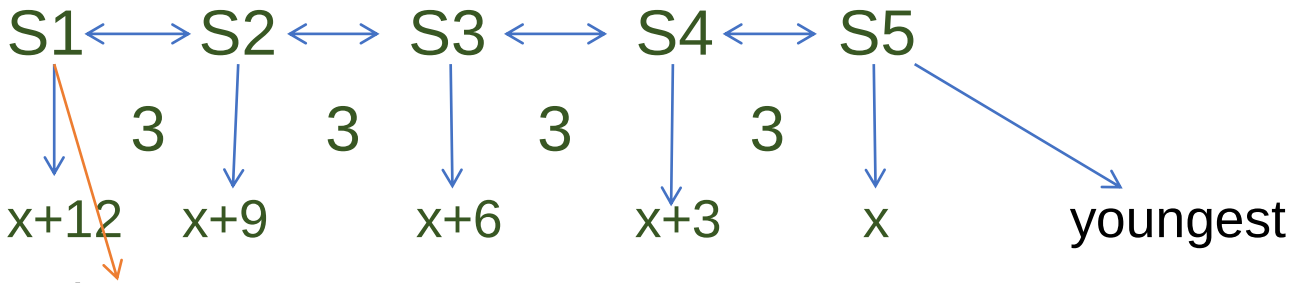
4x = 4 x 6 = 24 years

Ans: B

Ages

Q. Consider 5 siblings born apart by 3 years each. If the sum of the ages of all children is 50years. What is the age of youngest child?

Soln :



Eldest

Given,

Sum of ages = 50 years

x+12+x+9+x+6+x+3+x = 50

5x + 30 = 50

x = 4 years (age of youngest child)

Ages

Q. A mother said to her daughter " I was as old as you are at the time of your birth". If the mother's age is 38 years now. What was the daughter's age 5 years back?

A. 14years B. 19years C. 38years D. None of these

Soln:

	M	D
Present	38	x
At birth time	38-x	0

I was as old as you are at the time of your birth" shows

M D

38-x = x

38 = 2x

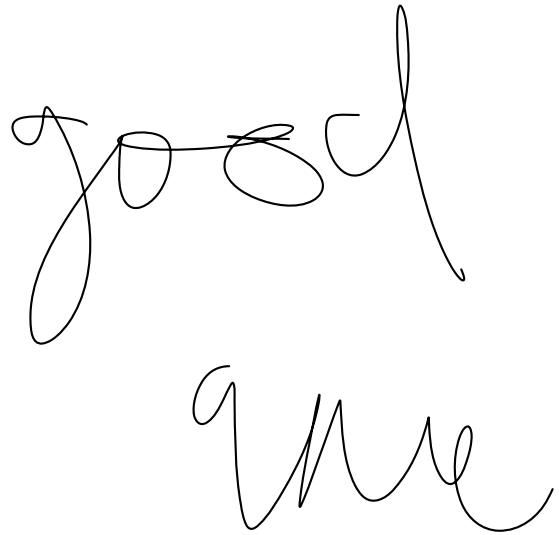
x =19 years(present age of daughter)

5years back, 19-5 = 14 years

Mother's age at time of birth = 38 –x

= 38 – 19

Ans: A = 19 years



Ages

Q. A is 2 years old than B who is twice as old as C. The total ages of A,B,C be 27. How old is B?

A. 5 years B. 12 years C. 10 years D. None of these

- **Soln**:
- So, we need to first find x here
- A = 2 + B
- B = 2C
- C = x
- So B becomes, B =2x
- So A becomes,
- A = 2 + B
- A = 2 + 2x

Given, the total age = A +B + C =27

Substitute the values here for A,B,C

2 +2x + 2x + x = 27

5x = 25

x=5years

Age of B = 2x = 2 x 5 =10 years

Ages

Q.A man who is 40 years old has three sons, ages 6, 3 and 1. In how many years will the combined age of his three sons equal 80% of his age?

A.5 B. 10 C. 15 D. 20

Soln:

- Let the condition occur after y years.
- After y years
- Man's age = (40+y)
- Son's ages (6+y), (3+y), (1+y)
- Sum of sons' ages = (10+3y)
- (10+3y) = 80/100(40+y)
- 5(10+3y) = 4 (40+y)
- 50 + 15y = 160 + 4y
- 11y = 110
- y = 10

Ans : B

Ages(Assignment)

Q. The ratio of Present age of A and B is 6:7. A is 7 years younger than C. C's age after 8 years will be 51 years. Then what is the difference between the present ages of A and B?

A. 3 Years B. 4 Years C. 5 Years D. 6 Years E. Cannot be determined

Ans : D

Ages(Assignment)

Q. The average age of A, B, C, D and E is 40 years. The average age of A and B is 35 years and the average of C and D is 42 years. Age of E is :

A. 48 years B. 46 years C. 42 years D. 45 years

Ans: B

Ages(Assignment)

Q. 10 years ago, age of father was thrice the age of his son. Ten years hence, father's age will be twice that of his son. The ratio of their present ages is:

A. 5:2 B. 7:3 C. 9:2 D. 13:4

Ans : B

Ages(Assignment)

Q. The average age of A, B and C is 28 years, if average age of B and C is 29 years. What is the age of A in years?

A. 24 years B. 26 years C. 28 years D. 30 years

Ans: B

Ages(Assignment)

Q. Sachin is younger than Rahul by 7 years. If their ages are in the respective ratio of 7 : 9, how old is Sachin?

A. 16 years B. 18 years C. 28 years D. 24.5 years E. None of these

Ans: D

$S = R - 7$ $S : R$

$7 : 9$

$2u = 7$ $u = \frac{7}{2}$

$\therefore S = 7 \times \frac{7}{2} = 24.5$

Ages(Assignment)

Q. At present, the ratio between the ages of Arun and Deepak is 4 : 3. After 6 years, Arun's age will be 26 years. What is the age of Deepak at present ?

A. 12 years B. 15 years C. 19.5 years D. 21 years E. None of these

Ans: B


THANK
YOU!