

1. In the first 10 overs of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 overs to reach the target of 282 runs?

- A. 6.25
B. 5.5
C. 7.4
D. 5

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Answer : Option A

Explanation :

Runs scored in the first 10 overs = $10 \times 3.2 = 32$

Total runs = 282

remaining runs to be scored = $282 - 32 = 250$

remaining overs = 40

Run rate needed = $\frac{250}{40} = 6.25$

2. A grocer has a sale of Rs. 6435, Rs. 6927, Rs. 6855, Rs. 7230 and Rs. 6562 for 5 consecutive months. How much sale must he have in the sixth month so that he gets an average sale of Rs. 6500?

- A. 4800
B. 4991
C. 5004
D. 5000

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Answer : Option B

Explanation :

Let the sale in the sixth month = x

Then $\frac{6435 + 6927 + 6855 + 7230 + 6562 + x}{6} = 6500$

=> $6435 + 6927 + 6855 + 7230 + 6562 + x = 6 \times 6500 = 39000$

=> $34009 + x = 39000$

=> $x = 39000 - 34009 = 4991$

3. The average of 20 numbers is zero. Of them, How many of them may be greater than zero , at the most?

- A. 1
B. 20
C. 0
D. 19

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Answer : Option D

Explanation :

Average of 20 numbers = 0

$$\Rightarrow \frac{\text{Sum of 20 numbers}}{20} = 0$$

\Rightarrow Sum of 20 numbers = 0

Hence at the most, there can be 19 positive numbers.

(Such that if the sum of these 19 positive numbers is x, 20th number will be -x)

4. The captain of a cricket team of 11 members is 26 years old and the wicket keeper is 3 years older. If the ages of these two are excluded, the average age of the remaining players is one year less than the average age of the whole team. Find out the average age of the team.

A. 23 years

B. 20 years

C. 24 years

D. 21 years

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Answer : Option A

Explanation :

Number of members in the team = 11

Let the average age of of the team = x

$$\Rightarrow \frac{\text{Sum of the ages of all the 11 members of the team}}{11} = x$$

\Rightarrow Sum of the ages of all the 11 members of the team = 11x

Age of the captain = 26

Age of the wicket keeper = 26 + 3 = 29

Sum of the ages of 9 members of the team excluding captain and wicket keeper

$$= 11x - 26 - 29 = 11x - 55$$

Average age of 9 members of the team excluding captain and wicket keeper

$$= \frac{11x - 55}{9}$$

Given that $\frac{11x - 55}{9} = (x - 1)$

$$\Rightarrow 11x - 55 = 9(x - 1)$$

$$\Rightarrow 11x - 55 = 9x - 9$$

$$\Rightarrow 2x = 46$$

$$\Rightarrow x = \frac{46}{2} = 23 \text{ years}$$

5. The average monthly income of A and B is Rs. 5050. The average monthly income of B and C is Rs. 6250 and the average monthly income of A and C is Rs. 5200. What is the monthly income of A?

A. 2000

B. 3000

C. 4000

D. 5000

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Answer : Option C

Explanation :

Let the monthly income of A = a

monthly income of B = b

monthly income of C = c

$$a + b = 2 \times 5050 \text{ ----- (Equation1)}$$

$$b + c = 2 \times 6250 \text{ ----- (Equation2)}$$

$$a + c = 2 \times 5200 \text{ ----- (Equation3)}$$

(Equation 1) + (Equation 3) - (Equation 2)

$$\Rightarrow a + b + a + c - (b + c) = (2 \times 5050) + (2 \times 5200) - (2 \times 6250)$$

$$\Rightarrow 2a = 2(5050 + 5200 - 6250)$$

$$\Rightarrow a = 4000$$

$$\Rightarrow \text{Monthly income of A} = 4000$$

6. A car owner buys diesel at Rs.7.50, Rs. 8 and Rs. 8.50 per litre for three successive years. What approximately is the average cost per litre of diesel if he spends Rs. 4000 each year?

A. Rs. 8

B. Rs. 7.98

C. Rs. 6.2

D. Rs. 8.1

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Answer : Option B

Explanation :

$$\text{Total Cost} = 4000 \times 3$$

$$\text{Total diesel used} = \frac{4000}{7.5} + \frac{4000}{8} + \frac{4000}{8.5}$$

$$\text{average cost per litre of diesel} = \frac{4000 \times 3}{\left(\frac{4000}{7.5} + \frac{4000}{8} + \frac{4000}{8.5}\right)} = \frac{3}{\left(\frac{1}{7.5} + \frac{1}{8} + \frac{1}{8.5}\right)}$$

It is important how you proceed from this stage. Remember time is very important here and if we solve this completely in the traditional way, it may take lot of time.

Instead, we can find out the approximate value easily and select the right answer from the given choices

$$\text{In this case answer} = \frac{3}{\left(\frac{1}{7.5} + \frac{1}{8} + \frac{1}{8.5}\right)}$$

$$\approx \frac{3}{\left(\frac{1}{8} + \frac{1}{8} + \frac{1}{8}\right)} \approx \frac{3}{\left(\frac{3}{8}\right)} \approx 8$$

Means we got that answer is approximately equal to 8. From the given choices, the answer can be 8 or 7.98 or 8.1 . But which one from these?

It will be easy to figure out. Just see here the denominator was $\frac{1}{7.5} + \frac{1}{8} + \frac{1}{8.5}$

and we approximated it as $\frac{3}{8}$. However

$$\frac{1}{7.5} + \frac{1}{8.5} = \frac{1}{8-.5} + \frac{1}{8+.5} = \frac{8+.5+8-.5}{(8-.5)(8+.5)}$$

$$= \frac{16}{(8^2 - .5^2)} \quad [\text{because } a^2 - b^2 = (a - b)(a + b)]$$

$$= \frac{16}{(64 - .25)}$$

$$\text{ie, } \frac{1}{7.5} + \frac{1}{8.5} = \frac{16}{(64 - .25)}$$

$$\text{We know that } \frac{1}{8} + \frac{1}{8} = \frac{1}{4} = \frac{16}{64}$$

$$\Rightarrow \frac{1}{7.5} + \frac{1}{8.5} > \frac{1}{8} + \frac{1}{8}$$

Early we had approximated the denominator as $\frac{3}{8}$

However from the above mentioned equations, now you know that actually denominator is slightly greater than $\frac{3}{8}$

It means that answer is slightly lower than 8. Hence we can pick the choice 7.98 as the answer

Try to remember the relations between numbers and which can help you to save a lot of time which can be very precious in competitive exams

7. In Kiran's opinion, his weight is greater than 65 kg but less than 72 kg. His brother does not agree with Kiran and he thinks that Kiran's weight is greater than 60 kg but less than 70 kg. His mother's view is that his weight cannot be greater than 68 kg. If all are correct in their estimation, what is the average of different probable weights of Kiran?

A. 70 kg

B. 69 kg

C. 61 kg

D. 67 kg

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Answer : Option D

Explanation :

Let Kiran's weight = x. Then

According to Kiran, $65 < x < 72$ -----(equation 1)

According to brother, $60 < x < 70$ -----(equation 2)

According to mother, $x \leq 68$ -----(equation 3)

Given that equation 1, equation 2 and equation 3 are correct. By combining these equations,

we can write as

$$65 < x \leq 68$$

That is $x = 66$ or 67 or 68

$$\text{average of different probable weights of Kiran} = \frac{66 + 67 + 68}{3} = 67$$

8. The average weight of 16 boys in a class is 50.25 kg and that of the remaining 8 boys is 45.15 kg. Find the average weights of all the boys in the class.

A. 48.55

B. 42.25

C. 50

D. 51.25

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Answer : Option A

Explanation :

Average weight of 16 boys = 50.25

Total Weight of 16 boys = 50.25×16

Average weight of remaining 8 boys = 45.15

Total Weight of remaining 8 boys = 45.15×8

Total weight of all boys in the class = $(50.25 \times 16) + (45.15 \times 8)$

Total boys = $16 + 8 = 24$

$$\begin{aligned} \text{Average weight of all the boys} &= \frac{(50.25 \times 16) + (45.15 \times 8)}{24} \\ &= \frac{(50.25 \times 2) + (45.15 \times 1)}{3} = (16.75 \times 2) + 15.05 = 33.5 + 15.05 \\ &= 48.55 \end{aligned}$$

9. A library has an average of 510 visitors on Sundays and 240 on other days. What is the average number of visitors per day in a month of 30 days beginning with a Sunday?

A. 290

B. 304

C. 285

D. 270

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Answer : Option C

Explanation :

in a month of 30 days beginning with a Sunday, there will be 4 complete weeks and another two days which will be Sunday and Monday

Hence there will be 5 Sundays and 25 other days in a month of 30 days beginning with

a Sunday

Average visitors on Sundays = 510

Total visitors of 5 Sundays = 510×5

Average visitors on other days = 240

Total visitors of other 25 days = 240×25

Total visitors = $(510 \times 5) + (240 \times 25)$

Total days = 30

Average number of visitors per day = $\frac{(510 \times 5) + (240 \times 25)}{30}$

= $\frac{(51 \times 5) + (24 \times 25)}{3} = (17 \times 5) + (8 \times 25) = 85 + 200 = 285$

10. A student's mark was wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half $\frac{1}{2}$. What is the number of students in the class?

A. 45

B. 40

C. 35

D. 30

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Answer : Option B

Explanation :

Let the total number of students = x

The average marks increased by $\frac{1}{2}$ due to an increase of $83-63=20$ marks.

But total increase in the marks = $\frac{1}{2} \times x = \frac{x}{2}$

Hence we can write as

$$\frac{x}{2} = 20$$

$$\Rightarrow x = 20 \times 2 = 40$$

11. A family consists of two grandparents, two parents and three grandchildren. The average age of the grandparents is 67 years, that of the parents is 35 years and that of the grandchildren is 6 years. The average age of the family is

A. $32 \frac{2}{7}$ years

B. $31 \frac{5}{7}$ years

C. $28 \frac{1}{7}$ years

D. $30 \frac{5}{7}$ years

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Answer : Option B

Explanation :

Total age of the grandparents = 67×2

Total age of the parents = 35×2

Total age of the grandchildren = 6×3

Average age of the family = $\frac{(67 \times 2) + (35 \times 2) + (6 \times 3)}{7}$

$$= \frac{134 + 70 + 18}{7} = \frac{222}{7} = 31 \frac{5}{7}$$

12. The average weight of A, B and C is 45 kg. If the average weight of A and B be 40 kg and that of B and C be 43 kg, what is the weight of B?

A. 31 kg

B. $28 \frac{1}{2}$ kg

C. 32 kg

D. $30 \frac{1}{2}$ kg

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Answer : Option A

Explanation :

Let the weight of A, B and C are a,b and c respectively.

Average weight of A,B and C = 45

$$a + b + c = 45 \times 3 = 135 \text{---equation(1)}$$

average weight of A and B = 40

$$a + b = 40 \times 2 = 80 \text{---equation(2)}$$

average weight of B and C = 43

$$b + c = 43 \times 2 = 86 \text{---equation(3)}$$

$$\text{equation(2)+equation(3)- equation(1)} \Rightarrow a + b + b + c - (a + b + c) = 80 + 86 - 135$$

$$\Rightarrow b = 80 + 86 - 135 = 166 - 135 = 31$$

$$\Rightarrow \text{weight of B} = 31$$

13. If the average marks of three batches of 55, 60 and 45 students respectively is 50, 55, 60, what is the average marks of all the students?

A. 53.23

B. 54.68

C. 51.33

D. 50

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Answer : Option B

Explanation :

Average marks of batch1 = 50

Students in batch1 = 55

Total marks of batch1 = 55×50

Average marks of batch2 = 55

Students in batch2 = 60

Total marks of batch2 = 60×55

Average marks of batch3 = 60

Students in batch3 = 45

Total marks of batch3 = 45×60

Total students = $55 + 60 + 45 = 160$

$$\begin{aligned} \text{Average marks of all the students} &= \frac{(55 \times 50) + (60 \times 55) + (45 \times 60)}{160} \\ &= \frac{275 + 330 + 270}{160} = \frac{875}{160} = 54.68 \end{aligned}$$

14. The average age of husband, wife and their child 3 years ago was 27 years and that of wife and the child 5 years ago was 20 years. What is the present age of the husband?

- A. 40
- B. 32
- C. 28
- D. 30

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Answer : Option A

Explanation :

let the present age of the husband = h

present age of the wife = w

present age of the child = c

3 years ago, average age of husband, wife and their child = 27

=> Sum of age of husband, wife and their child before 3 years = $3 \times 27 = 81$

=> $(h-3) + (w-3) + (c-3) = 81$

=> $h + w + c = 81+9 = 90$ -----equation(1)

5 years ago, average age of wife and child = 20

=> Sum of age of wife and child before 5 years = $2 \times 20 = 40$

=> $(w-5) + (c-5) = 40$

=> $w + c = 40 + 10 = 50$ -----equation(2)

Substituting equation(2) in equation(1)

=> $h + 50 = 90$

=> $h = 90 - 50 = 40$

=> present age of the husband = 40

15. The average weight of 8 person's increases by 2.5 kg when a new person comes in place of one of them weighing 65 kg. What is the weight of the new person?

A. 75 Kg

B. 50 Kg

C. 85 Kg

D. 80 Kg

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Answer : Option C

Explanation :

Total increase in weight = $8 \times 2.5 = 20$

If x is the weight of the new person, total increase in weight = $x - 65$

=> $20 = x - 65$

=> $x = 20 + 65 = 85$

16. There are two divisions A and B of a class, consisting of 36 and 44 students respectively. If the average weight of divisions A is 40 kg and that of division b is 35 kg. What is the average weight of the whole class?

A. 38.25

B. 37.25

C. 38.5

D. 37

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Answer : Option B

Explanation :

$$\Rightarrow 137 + x = 144$$

$$\Rightarrow x = 144 - 137 = 7$$

19. Arun obtained 76, 65, 82, 67 and 85 marks (out in 100) in English, Mathematics, Chemistry, Biology and Physics. What is his average mark?

- A. 53
B. 54
C. 72
D. 75

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Answer : Option D

Explanation :

$$\text{Average mark} = \frac{76 + 65 + 82 + 67 + 85}{5} = \frac{375}{5} = 75$$

20. Distance between two stations A and B is 778 km. A train covers the journey from A to B at 84 km per hour and returns back to A with a uniform speed of 56km per hour. Find the average speed of the train during the whole journey?

- A. 69.0 km /hr
B. 69.2 km /hr
C. 67.2 km /hr
D. 67.0 km /hr

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Answer : Option C

Explanation :

Solution 1 (Quick)

If a car covers a certain distance at x kmph and an equal distance at y kmph. Then,
the average speed of the whole journey = $\frac{2xy}{x+y}$ kmph.

By using the same formula, we can find out the average speed quickly

$$\begin{aligned} \text{average speed} &= \frac{2 \times 84 \times 56}{84 + 56} = \frac{2 \times 84 \times 56}{140} = \frac{2 \times 21 \times 56}{35} \\ &= \frac{2 \times 3 \times 56}{5} = \frac{336}{5} = 67.2 \end{aligned}$$

Solution 2 (Fundamentals)

Though it is a good idea to solve the problems quickly using formulas, you should know the fundamentals too. Let's see how we can solve these problems using basics

Train travels from A to B at 84 km per hour

Let the distance between A and B = x

$$\text{Total time taken for traveling from A to B} = \frac{\text{distance}}{\text{speed}} = \frac{x}{84}$$

Train travels from B to A at 56 km per hour

$$\text{Total time taken for traveling from B to A} = \frac{\text{distance}}{\text{speed}} = \frac{x}{56}$$

$$\text{Total distance traveled} = x + x = 2x$$

$$\text{Total time taken} = \frac{x}{84} + \frac{x}{56}$$

$$\text{Average speed} = \frac{\text{Total distance traveled}}{\text{Total time taken}} = \frac{2x}{\frac{x}{84} + \frac{x}{56}}$$

$$= \frac{2}{\frac{1}{84} + \frac{1}{56}} = \frac{2 \times 84 \times 56}{56 + 84} = \frac{2 \times 84 \times 56}{140} = \frac{2 \times 21 \times 56}{35} = \frac{2 \times 3 \times 56}{5}$$

$$= \frac{336}{5} = 67.2$$

21. The average age of boys in a class is 16 years and that of the girls is 15 years. What is the average age for the whole class?

- A. 15
B. 16
C. 15.5
D. Insufficient Data

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Answer : Option D

Explanation :

We do not have the number of boys and girls. Hence we can not find out the answer.

22. The average age of 36 students in a group is 14 years. When teacher's age is included to it, the average increases by one. Find out the teacher's age in years?

- A. 51 years
B. 49 years
C. 53 years
D. 50 years

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Answer : Option A

Explanation :

average age of 36 students in a group is 14

=> Sum of the ages of 36 students = 36×14

When teacher's age is included to it, the average increases by one => average = 15

=> Sum of the ages of 36 students and the teacher = 37×15

Hence teachers age = $37 \times 15 - 36 \times 14 = 37 \times 15 - 14(37 - 1) = 37 \times 15 - 37 \times 14 + 14$

= $37(15 - 14) + 14 = 37 + 14 = 51$

23. The average of five numbers is 27. If one number is excluded, the average becomes 25. What is the excluded number?

A. 30

B. 40

C. 32.5

D. 35

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Answer : Option D

Explanation :

Sum of 5 numbers = 5×27

Sum of 4 numbers after excluding one number = 4×25

Excluded number = $5 \times 27 - 4 \times 25 = 135 - 100 = 35$

24. The batting average for 40 innings of a cricket player is 50 runs. His highest score exceeds his lowest score by 172 runs. If these two innings are excluded, the average of the remaining 38 innings is 48 runs. Find out the highest score of the player.

A. 150

B. 174

C. 180

D. 166

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Answer : Option B

Explanation :

Total runs scored by the player in 40 innings = 40×50

Total runs scored by the player in 38 innings after excluding two innings = 38×48

Sum of the scores of the excluded innings = $40 \times 50 - 38 \times 48 = 2000 - 1824 = 176$

Given that the scores of the excluded innings differ by 172. Hence let's take

the highest score as $x + 172$ and lowest score as x

$$\text{Now } x + 172 + x = 176$$

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = \frac{4}{2} = 2$$

$$\text{highest score as } x + 172 = 2 + 172 = 174$$

25. The average score of a cricketer for ten matches is 38.9 runs. If the average for the first six matches is 42, what is the average for the last four matches?

A. 34.25

B. 36.4

C. 40.2

D. 32.25

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Answer : Option A

Explanation :

$$\text{Total runs scored in 10 matches} = 10 \times 38.9$$

$$\text{Total runs scored in first 6 matches} = 6 \times 42$$

$$\text{Total runs scored in the last 4 matches} = 10 \times 38.9 - 6 \times 42$$

$$\text{Average of the runs scored in the last 4 matches} = \frac{10 \times 38.9 - 6 \times 42}{4}$$

$$= \frac{389 - 252}{4} = \frac{137}{4} = 34.25$$

26. The average of six numbers is x and the average of three of these is y . If the average of the remaining three is z , then

A. None of these

B. $x = y + z$

C. $2x = y + z$

D. $x = 2y + 2z$

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Answer : Option C

Explanation :

$$\text{Average of 6 numbers} = x$$

$$\Rightarrow \text{Sum of 6 numbers} = 6x$$

$$\text{Average of the 3 numbers} = y$$

$$\Rightarrow \text{Sum of these 3 numbers} = 3y$$

Average of the remaining 3 numbers = z

\Rightarrow Sum of the remaining 3 numbers = $3z$

Now we know that $6x = 3y + 3z$

$\Rightarrow 2x = y + z$

27. Suresh drives his car to a place 150 km away at an average speed of 50 km/hr and returns at 30 km/hr. What is his average speed for the whole journey ?

A. 32.5 km/hr.

B. 35 km/hr.

C. 37.5 km/hr

D. 40 km/hr

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Answer : Option C

Explanation :

Solution 1 (Quick)

If a car covers a certain distance at x kmph and an equal distance at y kmph. Then,
the average speed of the whole journey = $\frac{2xy}{x+y}$ kmph.

By using the same formula, we can find out the average speed quickly

$$\begin{aligned} \text{average speed} &= \frac{2 \times 50 \times 30}{50 + 30} = \frac{2 \times 50 \times 30}{80} = \frac{2 \times 50 \times 3}{8} \\ &= \frac{50 \times 3}{4} = \frac{25 \times 3}{2} = \frac{75}{2} = 37.5 \end{aligned}$$

Solution 2 (Fundamentals)

Though it is a good idea to solve the problems quickly using formulas, you should know the fundamentals too. Let's see how we can solve this problems using basics.

$$\text{Total time taken for traveling one side} = \frac{\text{distance}}{\text{speed}} = \frac{150}{50}$$

$$\text{Total time taken for return journey} = \frac{\text{distance}}{\text{speed}} = \frac{150}{30}$$

$$\text{Total distance traveled} = 150 + 150 = 2 \times 150$$

$$\text{Total time taken} = \frac{150}{50} + \frac{150}{30}$$

$$\text{Average speed} = \frac{\text{Total distance traveled}}{\text{Total time taken}} = \frac{2 \times 150}{\frac{150}{50} + \frac{150}{30}}$$

$$= \frac{2}{\frac{1}{50} + \frac{1}{30}} = \frac{2 \times 50 \times 30}{30 + 50}$$

$$= \frac{2 \times 50 \times 30}{80} = \frac{2 \times 50 \times 3}{8}$$

$$= \frac{50 \times 3}{4} = \frac{25 \times 3}{2} = \frac{75}{2} = 37.5$$

28. The average age of a husband and his wife was 23 years at the time of their marriage. After five years they have a one year old child. What is the average age of the family ?

A. 21 years

B. 20 years

C. 18 years

D. 19 years

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Answer : Option D

Explanation :

$$\text{Total of the age of husband and wife} = 2 \times 23 = 46$$

Total of the age of husband and wife after 5 years + Age of the 1 year old child

$$= 46 + 5 + 5 + 1 = 57$$

$$\text{Average age of the family} = \frac{57}{3} = 19$$

29. In an examination, a student's average marks were 63. If he had obtained 20 more marks for his Geography and 2 more marks for his history, his average would have been 65. How many subjects were there in the examination?

- A. 12
B. 11
C. 13
D. 14

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Answer : Option B

Explanation :

Let the number of subjects = x

Then, Total marks he scored for all subjects = $63x$

If he had obtained 20 more marks for his Geography and 2 more marks for his history,

his average would have been 65

\Rightarrow Total marks he would have scored for all subjects = $65x$

Now we can form the equation as $65x - 63x = \text{the additional marks of the student} = 20 + 2 = 22$

$\Rightarrow 2x = 22$

$$\Rightarrow x = \frac{22}{2} = 11$$

30. The average salary of all the workers in a workshop is Rs.8000. The average salary of 7 technicians is Rs.12000 and the average salary of the rest is Rs.6000. How many workers are there in the workshop ?

- A. 21
B. 22
C. 23
D. 24

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Answer : Option A

Explanation :

Let the number of workers = x

Given that average salary of all the workers = Rs.8000

then total salary of all workers = $8000x$

Given that average salary of 7 technicians is Rs.12000

\Rightarrow Total salary of 7 technicians = $7 \times 12000 = 84000$

Number of the rest of the employees = $(x - 7)$

Average salary of the rest of the employees = Rs.6000

Total salary of the rest of the employees = $(x - 7)(6000)$

$8000x = 84000 + (x - 7)(6000)$

$\Rightarrow 8x = 84 + (x - 7)(6)$

$\Rightarrow 8x = 84 + 6x - 42$

$\Rightarrow 2x = 42$

$\Rightarrow x = \frac{42}{2} = 21$