

# Module Name: AVERAGES

## MODULE OBJECTIVE:

Decision making for planning, policy and management relies increasingly on the quantitative reasoning, which entails the collection, analysis and interpretation of quantitative data. This course is designed to introduce principles and techniques to solve averages related problems.

Develop logical reasoning in a problem solving framework. One goal is to develop a disciplined logical analysis of word problems. Such reasoning is the foundation for building simple mathematical models of problems-models implicit on averages. Students will use this reasoning often (consciously or unconsciously) in engineering to find out averages. However a logical mind will serve a person well in any field.

## At the end of these course students:

- 1) To be able to understand the types of formulae used to calculate averages.
- 2) To be solving many problems related to averages which can be useful to students to face interviews.

## Important Formula:

An average, or more accurately an arithmetic mean is, in crude terms, the sum of  $n$  different data divided by  $n$ .

The two mostly used formula in this chapter are:

1.  $\text{Average} = \frac{\text{Sum of quantities}}{\text{Number of quantities}}$ .
2. Suppose a man covers a certain distance at  $x$  kmph and an equal distance at  $y$  kmph, then the average speed during the whole journey is  $\frac{2xy}{x+y}$  kmph.

## SOLVED EXAMPLES:

(S.B.I.P.O.1997)

1. There are two sections A and B of a class, consisting of 36 and 44 students respectively. If the average weight of section A is 40kg and that of section B is 35kg, find the average weight of the whole class.

- a) 30kg      b) 35kg

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- c) 42.5kg      d) 37.25kg

Answer: d

Solution: Total weight of (36+44) Students=(36x40+44x35)kg=2980kg  
Therefore average weight of the whole class= (2980/80) kg Therefore  
average weight=37.25kg.

(R.R.B.2002)

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

- a) 60km/hr      b)30km/hr

- C) 67km/hr      d) 67.2km/hr

Answer: d

Solution: required average speed =  $(2xy/x+y)$  km/hr  
=  $(2 \times 84 \times 56 / 84 + 56)$  km/hr =  
 $(2 \times 84 \times 56 / 140)$  km/hr = 67.2km/hr.  
(M.A.T.2003) 3. A Batsman makes  
a score of 87 runs in the 17<sup>th</sup> inning  
and thus increases his average by 3.  
Find his average after 17<sup>th</sup> inning.

- a) 40      b) 39  
c) 52      d) 55

Answer: b

Solution: let the average after 17<sup>th</sup> inning =x  
Then average after 16<sup>th</sup> inning=(x-3)  
Therefore  $16(x-3)+87=17x$   
Therefore x=39

(Assistant grade,1998)

REASONING AND QUANTITATIVE APTITUDE AVERAGES







REASONING AND QUANTITATIVE APTITUDE AVERAGES

$$P+Q=(5050 \times 2)=10100 \quad (\text{i})$$

$$Q+R=(6250 \times 2)=12500 \quad (\text{ii})$$

$$P+R=(5200 \times 2)=10400 \quad (\text{iii})$$

$$\text{Adding (i),(ii) and (iii), we get: } 2(P+Q+R)=33000 \quad (\text{iv})$$

$$\text{Subtracting (ii) from (iv) we get } p=4000$$

$$\text{Therefore p's monthly income} = \text{Rs.4000}$$

(SASKEN 2003)

13. 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. What is the teacher's age in years

- a) 31   b)36  
b) 51   d)none of these

Answer:c

$$\begin{aligned} \text{Solution: age of teacher} &= (37 \times 15 - 36 \times 14) \text{ years} \\ &= 51 \text{ years} \end{aligned}$$

(R.R.B.2002)

14. The average monthly salary of 20 employees in an organizations is Rs.1500. if the manager's salary is added, the average salary increases by 100. What is the manager's monthly salary

- a) Rs.2000   b) Rs.2400  
C) Rs. 3600   d) Rs.4800

Answer:c

$$\begin{aligned} \text{Solution: manager's monthly salary} &= \text{Rs. } (1600 \times 21 - 1500 \times 20) \\ &= \text{Rs. } 3600 \end{aligned}$$

(BANK P.O.2000) 15.

- The average weight of 8 persons increases by 2.5kg when a new person comes in place of one of them weighing 65kg. What might be the weight of the new person?

- a) 76kg      b)76.5kg  
b) 85Kg      d)none of these

Answer:b

$$\begin{aligned} \text{Solution: total weight increased} &= (8 \times 2.5) \text{ kg} = 20 \text{ kg} \\ \text{Weight of new person} &= (65 + 20) \text{ kg} = 85 \text{ kg} \end{aligned}$$

(C.T.S 2003)

16. The average of 11 results is 50. If the average of first six results is 49 and that of last six is 52, find the sixth result.

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- a) 56  
c) 45
- b) 98  
d) 55

Answer: A

Solution:

The total of 11 results =  $11 \times 50 = 550$

The total of first 6 results =  $6 \times 49 = 294$

The total of last 6 results =  $6 \times 52 = 312$

The 6th result is common to both;

Sixth result =  $294 + 312 - 550 = 56$ .

(B.S.R.B 2002)

17. A man bought 13 shirts of Rs.50 each, 15 Pants of Rs.60 each and 12 pairs of shoes at Rs.65 a pair. Find the average value of each article.

- a) 58    b) 58.25  
c) 60    d) 48

Answer: B

Solution: Direct method:

$$\text{Average} = \frac{13 \times 50 + 15 \times 60 + 12 \times 65}{13 + 15 + 12} = \text{Rs } 58.25.$$

www.AptitudeAcademy.co.in (R.B.1.2004)

18. The average weight of 4 men is increased by 3 kg when one of them who weighs 120kg is replaced by another man. What is the weight of the new man?

- a) 130kg    b) 132kg  
b) 140kg    d) 180kg

Answer: b

Solution:

If the average weight is increased by 3 kg, then the sum of weights increases By  $3 \times 4 = 12\text{kg}$ .

And thus increase in weight is due to the extra weight included due to the inclusion Of new person.

Therefore weight of new man =  $120 + 12 = 132\text{kg}$ .

**EXERCISE PROBLEMS ON AVERAGES**

**Examples:**

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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. 6.5  
C. 6.75      D. 7

**Answer:** Option A **explanation:** Required run rate =

$$\left( \frac{282 - (3.2 \times 10)}{40} \right) = \frac{250}{40} = 6.25$$

2. A family consists of grandparents, 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. What is the average age of the family?

- A. 28 years      B. 31 years  
C. 32 years      D. None of these

Answer & Explanation

**Answer:** Option B

**Explanation:**

$$\begin{aligned} \text{Required} & \left( \frac{67 \times 2 + 35 \times 2 + 6}{2 + 2 + 3} \right) \times 3 \\ & = \left( \frac{134 + 70}{7} \right) + 18 \\ & = \frac{222}{7} \\ & = 31 \text{ years.} \end{aligned}$$



REASONING AND QUANTITATIVE APTITUDE AVERAGES

3. 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.Rs. 4991

B.Rs. 5991

C.Rs. 6001

D.Rs. 6991

[Answer & Explanation](#)

Answer: Option A

Explanation:

Total sale for 5 months = Rs.  $(6435 + 6927 + 6855 + 7230 + 6562) = \text{Rs. } 34009$ .

$\therefore$  Required sale = Rs.  $[(6500 \times 6) - 34009] = \text{Rs. } (39000 - 34009) = \text{Rs. } 4991$ .

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

A.0

B.1

C.10

D.19

[Answer & Explanation](#)

Answer: Option D

Explanation:

Average of 20 numbers = 0.

$\therefore$  Sum of 20 numbers  $(0 \times 20) = 0$ .

It is quite possible that 19 of these numbers may be positive and if their sum is  $a$  then 20th number is  $(-a)$ .

5. 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 might be the weight of the new person?

A.76 kg

B.76.5 kg

C.85 kg

D.Data inadequate

E.None of these

[Answer & Explanation](#)

Answer: Option C

Explanation:

Total weight increased =  $(8 \times 2.5) \text{ kg} = 20 \text{ kg}$ .

Weight of new person =  $(65 + 20) \text{ kg} = 85 \text{ kg}$ .

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6. 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. What is the average age of the team?

- A.23 years    B.24 years  
C.25 years    D.None of th

answer: Option A

**Explanation:**

Let the average age of the whole team by  $x$  years.

$$\therefore 11x - (26 + 29) = 9(x - 1)$$

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

$$\Rightarrow 46 - 2x = 46$$

$$\Rightarrow x = 23.$$

So, average age of the team is 23 years.

7. The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P is:

- A.3500                                  B.4000  
C.4050                                  D.5000

Answer & Explanation

**Answer:** Option B

**Explanation:**

Let P, Q and R represent their respective monthly incomes. Then, we have:

$$P + Q = (5050 \times 2) = 10100 \dots (i)$$

$$Q + R = (6250 \times 2) = 12500 \dots (ii)$$

$$P + R = (5200 \times 2) = 10400 \dots (iii)$$

$$\text{Adding (i), (ii) and (iii), we get: } 2(P + Q + R) = 33000 \text{ or } P + Q + R = 16500 \dots (iv)$$

Subtracting (ii) from (iv), we get  $P = 4000$ .

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∴ P's monthly income = Rs. 4000.

8. 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. The present age of the husband is:

A. 35 years

B. 40 years

C. 50 years

D. None of these

[Answer & Explanation](#)

Answer: Option B

Explanation:

Sum of the present ages of husband, wife and child =  $(27 \times 3 + 3 \times 3)$  years = 90 years.

Sum of the present ages of wife and child =  $(20 \times 2 + 5 \times 2)$  years = 50 years. ∴

Husband's present age =  $(90 - 50)$  years = 40 years.

9. A car owner buys petrol 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 petrol if he spends Rs. 4000 each year?

A. Rs. 7.98    B. Rs. 8

C. Rs. 8.50    D. Rs. 9

[Answer & Explanation](#)

Answer: Option A

Explanation:

$$\begin{aligned}
 \text{Total quantity of petrol} &= \left( \frac{4000}{7.50} + \frac{4000}{8} + \frac{4000}{8.50} \right) \text{ litres} \\
 \text{consumed in 3 years} &= 4000 \left( \frac{2}{15} + \frac{1}{8} + \frac{2}{17} \right) \text{ litres} \\
 &= \left( \frac{76700}{51} \right) \text{ litres}
 \end{aligned}$$

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Total amount spent = Rs. (3 x 4000) = Rs. 12000.

$$\left( \frac{12000}{3} \right) \times \frac{516120}{1000000} = \text{Rs. } 7.98 \therefore \text{Average cost} = \text{Rs. } 76700767$$

10. In Arun's opinion, his weight is greater than 65 kg but less than 72 kg. His brother does not agree with Arun and he thinks that Arun'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 Arun?

- A. 67 kg.
- B. 68 kg.
- C. 69 kg.
- D. Data inadequate
- E. None of these

Answer & Explanation

Answer: Option A

Explanation:

Let Arun's weight by X kg.

According to Arun,  $65 < X < 72$

According to Arun's brother,  $60 < X < 70$ .

According to Arun's mother,  $X \leq 68$

The values satisfying all the above conditions are 66, 67 and 68.

$$\therefore \text{Required average} = \frac{66 + 67 + 68}{3} = 67 \text{ kg.}$$

11. 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, then the weight of B is:

- A. 17 kg
- B. 20 kg
- C. 26 kg
- D. 31 kg

**Answer: Option D**

**Explanation:**

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Let A, B, C represent their respective weights. Then, we have:

$$A + B + C = (45 \times 3) = 135 \dots (i)$$

$$A + B = (40 \times 2) = 80 \dots (ii)$$

$$B + C = (43 \times 2) = 86 \dots (iii)$$

Adding (ii) and (iii), we get:  $A + 2B + C = 166 \dots (iv)$  Subtracting

(i) from (iv), we get :  $B = 31$ .

∴ B's weight = 31 kg.

12. 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. 47.55 kg B. 48 kg

C. 48.55 kg D. 49.25 kg **Answer:** Option C

**Explanation:**

Required  $\left\{ \begin{array}{l} \text{average} = \frac{50.25 \times 16 + 45.15 \times 8}{16 + 8} \\ = \frac{804 + 361.20}{24} \\ = \frac{1165.20}{24} \\ = 48.55 \end{array} \right\}$

13. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is:

A. 250 B. 276

C. 280 D. 285

**Answer & Explanation Answer:**

**Option D Explanation:**

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Since the month begins with a Sunday, to there will be five Sundays in the month.

$$\begin{aligned} \text{Required} & \left( \frac{510 \times 5 + 240}{\text{average} = 30} \right) \times 25 \\ & = \frac{8550}{30} \\ & = 285 \end{aligned}$$

14. If the average marks of three batches of 55, 60 and 45 students respectively is 50, 55, 60, then the average marks of all the students is:

- A.53.33    B.54.68  
C.55        D.None of these

Answer & Explanation

**Answer:** Option B

**Explanation:**

$$\begin{aligned} \text{Required} & \left( \frac{55 \times 50 + 60 \times 55 + 45 \times 60}{\text{average} = 55 + 60 + 45} \right) \\ & = \frac{2750 + 3300 + 2700}{160} \\ & = \frac{8750}{160} \\ & = 54.68 \end{aligned}$$

15. A pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half (1/2). The number of pupils in the class is:

- A.10        B.20  
C.40        D.73

Answer & Explanation

**Answer:** Option C

**Explanation:**

Let there be x pupils in the class.

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$$\text{Total increase in marks} \left( \begin{matrix} 1 \\ 2 \end{matrix} \right) = \frac{x}{2} = x \times \frac{1}{2} =$$

$$\Rightarrow \frac{x}{2} = (83 - 63) \Rightarrow x = 20 \times 2 = 40$$

16. Find the average of all these numbers. 142, 147, 153, 165, 157.

- a) 152 b) 162  
c) 146 d) 152.8

Answer: d

**Solution:**

142 147 153 165 157

Here consider the least number i.e., 142

Comparing with others,

142	147	153	165	157
	+5	+11	+23	+15

Now add 5+11+23+15 = 52/5 = 10.8

Now add 10.8 to 142 we get 152.8

(Average of all these numbers).

**Answer is 152.8**

17. Find the average of all these numbers. 4, 10, 16, 22, 28

- a) 10 b) 15  
c) 20 d) 16

Answer: d

**Solution:**

4, 10, 16, 22, 28

As the difference of number is 6

Then the average of these numbers is central one i.e., 16. Answer is 16.

18. Find the average of all these numbers. 4, 10, 16, 22, 28, 34.

- A) 15 B) 19  
C) 20 D) 25

Answer: b

**Solution:**

Here also difference is 6.

Then middle numbers 16, 22 take average of these

Two numbers  $16+22/2=19$





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32 years for Mr and Mrs Sharma then  $32*2=64$  years.

Then present age including their son is 22 years.

So  $22*3=66$  years.

Therefore son age will be  $66-64=2$  years.

**Answer is 2 years.**

23. The average price of 10 books is increased by 17 Rupees when one of them whose value is Rs.400 is replaced by a new book. What is the price of new book?

a) 500Rs      b) 600Rs

c) 570 Rs     d) 670 Rs

Answer: c

**Solution:** 10 books

Average increases

by 17 Rupees So

$10*17=170$ .

So the new book cost is more and by adding its cost average

Increase, therefore the cost of new book is  $400+170=570$ Rs. **Answer**

**is 570 Rs**

24. The average marks of girls in a class is 62.5. The average marks of 4 girls among them is 60. The average marks of remaining girls is 63, then what is the number of girls in the class?

a) 24 girls      b) 26 girls

c) 40 girls      d) 50 girls

Answer: a

**Solution:**

Total number of girls be  $x+4$ .

Average marks of 4 girls are 60.

Therefore  $62.5-60=2.5$  Then

$4*2.5=10$ .

The average of remaining girls is 63

Here 0.5 difference therefore  $0.5*x=10$  (since we got from 4 girls)

(This is taken because both should be equal)

$x=10/0.5$

$x=20$ .

This clearly says that remaining are 20 girls

Therefore total is  $x+4=20+4=24$  girls

**Answer is 24 girls.**

25. Find the average of first 50 natural numbers.

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a) 15 b) 15.5

c) 16 d) 16.5

Answer: b

**Solution:**

Sum of the Natural Numbers is  $n(n+1)/2$

Therefore for 50 Natural numbers  $50*51/2=775$ .

The average is  $775/50=15.5$  **Answer is 15.5.**

26. The average of the first nine prime number is?

a)  $11 \frac{1}{9}$  b)  $12 \frac{1}{9}$

c)  $13 \frac{1}{9}$  d)  $14 \frac{1}{9}$

Answer: a

**Solution:**

Prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23

Therefore  $2+3+5+7+11+13+17+19+23=100$

Then the average  $100/9= 11 \frac{1}{9}$ .

**Answer is  $11 \frac{1}{9}$ .**

27. The average of 2, 7, 6 and x is 5 and the average of 18, 1, 6, x and y is 10. what is the value of y?

a) 20

b) 59

c) 40

d) 54

Answer: a

**Solution:**

$$2+7+6+x/4=5$$

$$\Rightarrow 15+x=20$$

$$\Rightarrow x=5.$$

$$18+1+6+x+y/5=10$$

$$\Rightarrow 25+5+y=50$$

$$\Rightarrow y=20.$$

28. The average of a non-zero number and its square is 5 times the number. The number is

A) 7 B) 9

C) 10 D) 11

Answer: b

**Solution:**

The number be x

then  $x+x^2/2=5x$

$$\Rightarrow x^2-9x=0 \Rightarrow x(x-$$

$$9)=0 \text{ therefore } x=0$$

or  $x=9$ . **The number**

**is 9.**



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$$\Rightarrow 6x + 12 = 114$$

$$\Rightarrow 6x = 102$$

$$\Rightarrow x = 17.$$

**Answer is 17.**

32. A family consists of grandparents, parents and three grandchildren. The average age of the grandparents is 67 years, that of parents is 35 years and that of the grand children is 6 years. What is the average age of the family?

- a) 31 years      b) 35 years  
c) 50 years      d)  $31 \frac{5}{7}$  years

Answer: d

**Solution:**

Grandparents age is  $67 * 2 = 134$

Parents age is  $35 * 2 = 70$

Grandchildren age is  $6 * 3 = 18$

Therefore age of family is  $134 + 70 + 18 = 222$

Average is  $222 / 7 = 31 \frac{5}{7}$  years. **Answer is**

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

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

- a) 255      b) 455  
c) 285      d) 670

Answer: c

**Solution:**

Here specified that month starts with Sunday so, in a month there are 5 Sundays.

Therefore remaining days will be 25 days.

$$510 * 5 + 240 * 25 = 2550 + 6000$$

$$= 8550 \text{ visitors.}$$

The average visitors are  $8550 / 30 = 285$ .

**Answer is 285.**

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

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

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answer: c

**Solution:**

Total age for 39 persons is  $39 \times 15 = 585$  years.

Now 40 persons is  $40 \times 61/4 = 610$  years

(since 15 years 3 months =  $15 \frac{3}{12} = 61/4$ )

Age of the teacher =  $610 - 585$  years  $\Rightarrow 25$  years.

**Answer is 25 years.**

35. The average weight of a 10 oarsmen in a boat is increases by 1.8 Kgs .When one of the crew ,who weighs 53 Kgs is replaced by new man. Find the weight of the new man.

- a) 70 kgs      b) 75kgs  
c) 50kgs      d) 71kgs

Answer: d

**Solution:**

Weight of 10 oars men is increases by 1.8 Kgs

so,  $10 \times 1.8 = 18$  Kgs

Therefore  $53 + 18 = 71$  Kgs will be the weight of the man. **Answer is 71 Kgs.**

36. A bats man makes a score of 87 runs in the 17th inning and thus increases his average by 3. Find the average after 17th inning.

- a) 35    b) 45  
c) 50    d) 39

Answer: d

**Solution:**

Average after 17 th inning = x

then for 16th inning is x-3.

Therefore  $16(x-3) + 87 = 17x$

$\Rightarrow x = 87 - 48 \Rightarrow x = 39$ .

**Answer is 39.**

37. The average age of a class is 15.8 years .The average age of boys in the class is 16.4 years while that of the girls is 15.4 years .What is the ratio of boys to girls in the class.

- a) 3:2    b) 2:3  
c) 4:5    d) 7:3

answer: b

**Solution:**

Ratio be k:1 then

$k \times 16.4 + 1 \times 15.4 = (k+1) \times 15.8$

$\Rightarrow (16.4 - 15.8)k = 15.8 - 15.4$

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$$\Rightarrow k = 0.4/0.6$$

$$\Rightarrow k = 2/3$$

therefore  $2/3:1 \Rightarrow 2:3$

**Answer is 2:3**

38. In a cricket eleven, the average of eleven players is 28 years. Out of these, the average ages of three groups of players each are 25 years, 28 years, and 30 years respectively. If in these groups, the captain and the youngest player are not included and the captain is eleven years older than the youngest player, what is the age of the captain?

a) 30 years

b) 40 years

c) 35 years

d) 50 years

Answer: c

**Solution:** let the age of youngest player be  $x$  then

age of the captain  $= (x+11)$

$$\text{therefore } 3 \times 25 + 3 \times 28 + 3 \times 30 + x + x + 11 = 11 \times 28$$

$$\Rightarrow 75 + 84 + 90 + 2x + 11 = 308$$

$$\Rightarrow 2x = 48 \Rightarrow x = 24.$$

Therefore age of the captain  $= (x+11) = 24+11 = 35$  years. **Answer is 35 years.**

39. The average age of the boys in the class is twice the number of girls in the class. If the ratio of boys and girls in the class of 36 be 5:1, what is the total of the age (in years) of the boys in the class?

a) 360 years      b) 400 years

c) 450 years      d) 500 years

Answer: a

**Solution:** Number of boys  $= 36 \times \frac{5}{6} = 30$

Number of girls  $= 6$

Average age of boys  $= 2 \times 6 = 12$  years

Total age of the boys  $= 30 \times 12 = 360$  years

**Answer is 360 years.**

40. Five years ago, the average age of P and Q was 15 years, average age of P, Q, and R today is 20 years, how old will R be after 10 years?

A) 40 Years      b) 30 years

c) 45 years      d) none

answer: b

**Solution:** Age of P and Q are  $15 \times 2 = 30$  years

Present age of P and Q is  $30 + 5 \times 2 = 40$  years.

Age of P, Q and R is  $20 \times 3 = 60$  years.

R, present age is  $60 - 40 = 20$  years

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After 10 years =  $20+10=30$  years.

**Answer is 30 years.**

41. The average weight of 3 men A, B and C is 84 Kgs. Another man D joins the group and the average now becomes 80 Kgs. If another man E whose weight is 3 Kgs more than that of D, replaces A then the average weight B, C, D and E becomes 79 Kgs. The weight of A is.

- a) 75kgs      b) 50 kgs  
c) 40 kgs      d) 45kgs

answer: a

**Solution:**

Total weight of A, B and C is  $84 * 3 = 252$  Kgs. Total weight of A, B, C and D is  $80 * 4 = 320$  Kgs. Therefore  $D = 320 - 252 = 68$  Kgs.

E weight  $(68+3) = 71$  kgs

Total weight of B, C, D and E =  $79 * 4 = 316$  Kgs

$(A+B+C+D) - (B+C+D+E) = 320 - 316 = 4$  Kgs

$A - E = 4$  Kgs

$A - 71 = 4$  kgs

$A = 75$  Kgs

**Answer is 75 kgs**

42. A team of 8 persons joins in a shooting competition. The best marksman scored 85 points. If he had scored 92 points, the average score for the team would have been 84. The team scored was.

- a) 600    b) 900  
c) 665    d) 660

Answer: c

**Solution:**

Here consider the total score be x.

therefore  $x + 92 - 85 / 8 = 84$

$\Rightarrow x + 7 = 672$

$\Rightarrow x = 665.$

**Answer is 665**

43. A man whose bowling average is 12.4, takes 5 wickets for 26 runs and thereby decreases his average by 0.4. The number of wickets, taken by him before his last match is

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46. Of the three numbers the first is twice the second and the second is twice the third. The average of the reciprocal of the numbers is  $\frac{7}{72}$ , the numbers are.

- a) 20, 12, 6      b) 24, 12, 5  
c) 24, 12, 6      d) 23, 21, 6

Answer: c

**Solution:**

Let the third number be  $x$

Let the second number be  $2x$ .

Let the first number be  $4x$ .

Therefore average of the reciprocal means

$$\frac{1}{x} + \frac{1}{2x} + \frac{1}{4x} = \left(\frac{7}{72} \times 3\right)$$

$$\frac{7}{4x} = \frac{7}{24}$$

$$\Rightarrow 4x = 24$$

$$x = 6.$$

Therefore First number is  $4 \times 6 = 24$ .

Second number is  $2 \times 6 = 12$

Third number is  $1 \times 6 = 6$

**Answer is 24, 12, 6.**

47. The average of 5 numbers is 7. When 3 new numbers are added the average of the eight numbers is 8.5. The average of the three new numbers is:

- a) 12    b) 11  
c) 13    d) 10

answer: b

**Solution:**

$$\text{Sum of three new numbers} = (8 \times 8.5 - 5 \times 7) = 33$$

$$\text{Their average} = \frac{33}{3} = 11. \text{ **Answer is 11.**}$$

48. The average temperature of the town in the first four days of a month was 58 degrees. The average for the second, third, fourth and fifth days was 60 degree. If the temperature of the first and fifth days were in the ratio 7:8 then what is the temperature on the fifth day?

- a) 60 degrees    b) 50 degrees  
c) 45 degrees    d) 64 degrees

answer: d

**Solution :**

Sum of temperature on 1st 2nd 3rd

and 4th days =  $58 \times 4 = 232$  degrees.

Sum of temperature on 2nd 3rd 4th

and 5th days =  $60 \times 4 = 240$  degrees

Therefore 5th day temperature is  $240 - 232 = 8$  degrees. The ratio given for 1st and 5th days be  $7x$  and  $8x$  degrees then  $8x - 7x = 8$

**=>x=8. therefore temperature on the 5th day = $8x=8*8=64$  degrees.**

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**QUESTION BANK MOCK TEST:**

1. The average age of 15 students of a class is 15 years. Out of these, the average age of 5 students is 14 years and that of the other 9 students is 16 years. The age of the 15<sup>th</sup> student is.  
a) 11years      b) 15 years  
c) 11.3years    d) 16 years

Answer: A

2. The average of ten numbers is 7. If each number is multiplied by 12., then the average of the new set of number is.  
a) 7                                  b)9  
b) 18                                d)84

Answer: D

3. Out of 9 persons, 8 persons spent Rs.30 each for their meals. The ninth one spent Rs.20 more than the average expenditure of all the nine. The total money spent by all of them was.  
a) 260/- b)300/-  
c) 400/- d) 292.50/-

Answer: D

4. In an examination a batch of 60 students made an average score of 55 and another batch of 40 made it only 45. What is the overall average score?  
a) 52    b)40  
c) 51    d)56

Answer: C

5. The average marks of a student in four subjects are 75. If the student obtained 80m marks in the 5<sup>th</sup> subject then the new average is  
a) 80    b)76  
c) 92    d) 89

Answer: B

6. The average of first 61 natural numbers is

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- a) 30    b) 31
- c) 35    d) 32

Answer :B

7. The average age of a group of 16 persons is 28 years and 3 months. Two persons each 58 years old left the group. The average age of the remaining persons is,
- a) 26    b) 24
  - c) 22    d) 20

Answer: B

8. The average weight of 50 balls is 5gm. If the weight of the bag be included the average weight increases by 0.05gm. What is the weight of the bag?
- a) 5.05b?)7.05
  - b) 7.55d)20

Answer: C

9. A man drives to his office at 60km/hr and returns home along the same route at 30km/hr. find the average speed.
- a) 50km/hr                              b) 45km/hr
  - c) 40km/hr                              d) 55km/hr

Answer: C

10. The average weight of 8 persons is increased by 2.5kg when one of them who weighs 56kg is replaced by a new man. The weight of the new man is.
- a) 73kg            b) 72kg
  - c) 80kg d) 76kg

Answer: D

11. A train travels from A to B at the rate of 20km/hr and from B to A at the rate of 30km/hr. what is the average rate of the whole journey.
- a) 24km/hr                              b)30km/hr
  - b) 40km/hr                              d)50km/hr

Answer: A

12. A car owner buys petrol at RS. 7.50, Rs.8 and Rs.8.50 per liter for successive years. What approximately is the average cost per liter of petrol if he spends Rs.4000 each year.
- a) Rs.7.98                              b)Rs.8

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b) Rs. 8.50

d)Rs.9

Answer: A

13. A library has an average of 520 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is.

a) 250 b) 276

c)2 80 d)285

Answer: D

14. If the average marks of three batches of 55,60 and 45 students respectively is 50,55 and 60 then the average marks of all the students is

a)53.33

b)54.68

c) 55

d) none of these

Answer: B

15. The average of a non zero number and its square is 5 times the number. The number is

a) 9 b)17

c) 29 d)295

answer: A

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16. 16 children are to be divided into two groups A and B of 10 and 6 children. The average percent marks obtained by the children of group A is 75 and the average percent marks of all the 16 children is 76. What is the average percent mark of children of group B.

A)  $77 \frac{1}{3}$  B)  $77 \frac{2}{3}$

B)  $78 \frac{1}{3}$  D)  $78 \frac{2}{3}$

ANSWER: B

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

a)  $X= y+z$

b) $2x=y+z$

c) $x=2y+2z$

d)none of these

Answer: B

18. Of the three numbers the average of the first and the second is greater than the average of second and the third by 15.what is the difference between the first and the third of the three numbers?

a) 15 b)45

c)55 d)none of these

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Answer: D

19. A cricketer whose bowling average is 12.4 runs per wicket takes 5 wickets for 26 runs and thereby decreases his average by 0.4. the number of wickets taken by him till the last match was.
- a) 64    b)72  
c)80    d)85

Answer: D

20. 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. The present age of the husband is
- a) 35 years    b)40 years  
c)50 years    d) none of these

Answer: B

21. the average age of students of a class is 15.8 years. The average age of boys in the class is 16.4 years and that of the girls is 15.4 years. The ratio of the number of boys to the number of girls in the class is.
- a)1:2    b)2:3  
c)3:4    d)3:5

Answer: B

22. In an examination a pupil's average marks were 63 per paper. If he had obtained 20 more marks for his Geography paper and 2 more marks for this History paper, his average per paper would have been 65. How many papers were there in the examination?
- a) 8    b)10  
c)11    d)12

Answer: C

23. the average of 11 number is 10.9. if the average of first six number is 10.5 and that of the last six numbers is 11.4, then the middle number is
- a)11    b)11.3  
c)11.4    d)11.5

Answer: d

24. a pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half. The number of pupil's in the class is.
- a) 10    b)20  
c)40    d)73

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Answer: C

25. If the arithmetic mean of seventy five numbers is calculated it is 35. If each number is increased by 5, then mean of new numbers is.

- a)30
- b)40
- c)70
- d)90

answer: B

26. A company produces on an average 4000 items per month for the first 3 months. How many items it must produce on an average per month over the next 9 months, to average 4375 items per month over the whole.

- A)4500
- B)4600
- C)4680
- D)4710

ANSWER: A

27. 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. The highest score of the player is.

- a)165 runs
- b)9170 runs
- c)172 runs
- d)174 runs

Answer: D

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28. 3 years ago, the average age of a family of 5 members was 17 years. A baby having been born, the average age of the family is the same today. The present age of the baby is.

- a)1 year
- b) 2years
- c)1 ½ years
- d) 3 years

Answer: C

29. 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. The average age of the family now is.

- a)19 years
- b)23 years
- c)28.5 years
- d)29.3 years

Answer: A

30. Three years ago, the average age of A and B was 18 years. With C joining them, the average age becomes 22 years. How old is C now?

- a)24 years
- b)27years
- c)28 years
- d)30 years

Answer: A

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