

Quant Mahayagya



1. A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of his son is:

- A. 14 years
- B. 18 years
- C. 20 years
- D. 22 years
- E. 25 years

2. The angle between the minute hand and the hour hand of a clock when the time is 8.30, is:

- A. 80°
- B. 75°
- C. 60°
- D. 105°
- E. 50

3. A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Rs. 6500 for 6 months, B, Rs. 8400 for 5 months and C, Rs. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit earned was Rs. 7400. Calculate the share of B in the profit.

- A. Rs. 1900
- B. Rs. 2660
- C. Rs. 2800
- D. Rs. 2840
- E. Rs. 2940

4. The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is:

- A. 625
- B. 630
- C. 640
- D. 650
- E. 660

5. A and B can do a piece of work in 30 days, while B and C can do the same work in 24 days and C and A in 20 days. They all work together for 10 days when B and C leave. How many days more will A take to finish the work?

- A. 18 days
- B. 24 days
- C. 30 days
- D. 36 days
- E. 40 days

6. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

- A. 70 km/hr
- B. 75 km/hr
- C. 84 km/hr
- D. 87.5 km/hr
- E. 90 km/hr

7. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

- A. 360
- B. 480
- C. 720
- D. 5040
- E. None of these

8. The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is:

- A. 2530 m²
- B. 2420 m²
- C. 2480 m²
- D. 2520 m²
- E. 2560 m²

9. The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?

- A. 3
- B. 4
- C. 9
- D. Cannot be determined
- E. None of these

10. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share?

- A. Rs. 500
- B. Rs. 1500
- C. Rs. 2000
- D. None of these
- E. Cannot be determined

11. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

- A. 5 hours
- B. 10 hours
- C. 15 hours
- D. 30 hours
- E. 25 hours

12. A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5?

- A. 6 litres, 8 litres
- B. 6 litres, 6 litres
- C. 5 litres, 7 litres
- D. 6 litres, 5 litres
- E. 7 litres, 6 litres

13. At a game of billiards, A can give B 15 points in 60 and A can give C 20 points in 60. How many points can B give C in a game of 90?

- A. 30 points
- B. 20 points

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- C. 10 points
- D. 12 points
- E. 15 points

14. What is the probability of getting a sum 9 from two throws of a dice?

- A. $\frac{3}{6}$
- B. $\frac{1}{6}$
- C. $\frac{3}{9}$
- D. $\frac{7}{9}$
- E. $\frac{1}{9}$

15. A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red, is:

- A. $\frac{3}{61}$
- B. $\frac{2}{61}$
- C. $\frac{2}{91}$
- D. $\frac{7}{91}$
- E. $\frac{1}{91}$

16. Which of the following statements is not correct?

- A. $\log_{10} 10 = 1$
- B. $\log (2 + 3) = \log (2 \times 3)$
- C. $\log_{10} 1 = 0$
- D. $\log (1 + 2 + 3) = \log 1 + \log 2 + \log 3$
- E. All are correct

17. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

- A. 8.5 km/hr
- B. 9 km/hr
- C. 10 km/hr
- D. 12.5 km/hr
- E. 15 km/hr

18. A boat covers a certain distance downstream in 1 hour, while it comes back in 1 hours. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?

- A. 12 kmph
- B. 13 kmph
- C. 14 kmph
- D. 15 kmph
- E. None of these

19. If a quarter kg of potato costs 60 paise, how many paise will 200 gm cost?

- A. 48 paise
- B. 54 paise
- C. 56 paise
- D. 72 paise
- E. 40 paise.

20. A wheel that has 6 cogs is meshed with a larger wheel of 14 cogs. When the smaller wheel has made 21 revolutions, then the number of revolutions made by the larger wheel is:

- A. 4
- B. 9
- C. 12
- D. 49
- E. 20

21. Find the value of x?

If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$, then the value of x is:

- A. 2
- B. 4
- C. 3
- D. 8
- E. 5

22. Find the value of x?

If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$

- A. 2
- B. 4
- C. 3
- D. 8
- E. 5

23. Let N be the greatest number that will divide 1305, 4665 and 6905, leaving the same remainder in each case. Then sum of the digits in N is:

- A. 4
- B. 5
- C. 6
- D. 8
- E. 7

24. 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. 26 years
- E. 27 years

25. It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?

- A. Sunday
- B. Saturday
- C. Friday
- D. Wednesday
- E. None of these

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1. Answer: Option D

Let the son's present age be x years. Then, man's present age = $(x + 24)$ years.

$$(x + 24) + 2 = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$x = 22.$$

2. Answer: Option B

Angle traced by hour hand in $17\frac{1}{2}$ hrs = $360/12 \times 17\frac{1}{2} = 255^\circ$.

Angle traced by min. hand in 30 min. = $360/60 \times 30^\circ = 180^\circ$.

Required angle = $(255 - 180)^\circ = 75^\circ$.

3. Answer: Option B

For managing, A received = 5% of Rs. 7400 = Rs. 370.

Balance = Rs. $(7400 - 370)$ = Rs. 7030.

Ratio of their investments = $(6500 \times 6) : (8400 \times 5) : (10000 \times 3)$

$$= 39000 : 42000 : 30000$$

$$= 13 : 14 : 10$$

B's share = Rs. $7030 \times 14/37$ = Rs. 2660.

4. Answer: Option A

Let the sum be Rs. x . Then,

$$C.I. = \left[x \left(1 + \frac{4}{100} \right)^2 - x \right] = \left(\frac{676}{625}x - x \right) = \frac{51}{625}x.$$

$$S.I. = \left(\frac{x \times 4 \times 2}{100} \right) = \frac{2x}{25}.$$

$$\therefore \frac{51x}{625} - \frac{2x}{25} = 1$$

$$\Rightarrow x = 625.$$

5. Answer: Option A

$$2(A + B + C)'s \text{ 1 day's work} = \left(\frac{1}{30} + \frac{1}{24} + \frac{1}{20} \right) = \frac{15}{120} = \frac{1}{8}.$$

$$\text{Therefore, } (A + B + C)'s \text{ 1 day's work} = \frac{1}{2 \times 8} = \frac{1}{16}.$$

$$\text{Work done by A, B, C in 10 days} = \frac{10}{16} = \frac{5}{8}.$$

$$\text{Remaining work} = \left(1 - \frac{5}{8} \right) = \frac{3}{8}.$$

$$A's \text{ 1 day's work} = \left(\frac{1}{16} - \frac{1}{24} \right) = \frac{1}{48}.$$

Now, $\frac{1}{48}$ work is done by A in 1 day.

$$\text{So, } \frac{3}{8} \text{ work will be done by A in } \left(48 \times \frac{3}{8} \right) = 18 \text{ days.}$$

6. Answer: Option D

Let the speed of two trains be $7x$ and $8x$ km/hr.

Then, $8x = 400/4 = 100$

$$x = 100/8 = 12.5$$

Speed of first train = (7×12.5) km/hr = 87.5 km/hr.

7. Answer: Option C

The word 'LEADING' has 7 different letters.

When the vowels EAI are always together, they can be supposed to form one letter.

Then, we have to arrange the letters LNDG (EAI).

Now, $5 (4 + 1 = 5)$ letters can be arranged in $5! = 120$ ways.

The vowels (EAI) can be arranged among themselves in $3! = 6$ ways.

Required number of ways = $(120 \times 6) = 720$.

8. Answer: Option D

We have: $(l - b) = 23$ and $2(l + b) = 206$ or $(l + b) = 103$.

Solving the two equations, we get: $l = 63$ and $b = 40$.

Area = $(l \times b) = (63 \times 40) \text{ m}^2 = 2520 \text{ m}^2$.

9. Answer: Option B

Let the ten's digit be x and unit's digit be y .

Then, $(10x + y) - (10y + x) = 36$

$$9(x - y) = 36$$

$$x - y = 4.$$

10. Answer: Option C

Let the shares of A, B, C and D be Rs. $5x$, Rs. $2x$, Rs. $4x$ and Rs. $3x$ respectively.

Then, $4x - 3x = 1000$

$$x = 1000.$$

B's share = Rs. $2x = \text{Rs. } (2 \times 1000) = \text{Rs. } 2000$.

11. Answer: Option C

Suppose, first pipe alone takes x hours to fill the tank.

Then, second and third pipes will take $(x - 5)$ and $(x - 9)$ hours respectively to fill the tank.

$$1/x + 1/(x - 5) = 1/(x - 9)$$

$$x - 5 + x / x(x - 5) = 1/(x - 9)$$

$$(2x - 5)(x - 9) = x(x - 5)$$

$$x^2 - 18x + 45 = 0$$

$$(x - 15)(x - 3) = 0$$

$$x = 15. \text{ [neglecting } x = 3]$$

12. Answer: Option B

Let the cost of 1 litre milk be Re. 1

Milk in 1 litre mix. in 1st can = $\frac{3}{4}$ litre, C.P. of 1 litre mix. in 1st can Re. $\frac{3}{4}$

Milk in 1 litre mix. in 2nd can = $\frac{1}{2}$ litre, C.P. of 1 litre mix. in 2nd can Re. $\frac{1}{2}$

Milk in 1 litre of final mix. = $\frac{5}{8}$ litre, Mean price = Re. $\frac{5}{8}$

By the rule of alligation, we have:

C.P. of 1 litre mixture in 1 st can		C.P. of 1 litre mixture in 2 nd can
$\frac{3}{4}$		$\frac{1}{2}$
	Mean Price	
	$\frac{5}{8}$	
$\frac{1}{8}$		$\frac{1}{8}$

$$\therefore \text{Ratio of two mixtures} = \frac{1}{8} : \frac{1}{8} = 1 : 1.$$

So, quantity of mixture taken from each can = $\left(\frac{1}{2} \times 12 \right) = 6$ litres.

13. Answer: Option C

A : B = 60 : 45.

A : C = 60 : 40.

B/C = B/A \times A/C = $45 / 60 \times 60 / 40 = 45 / 40 = 90/80$

B can give C 10 points in a game of 90.

14. Answer: Option C

In two throws of a dice, $n(S) = (6 \times 6) = 36$.

Let E = event of getting a sum = {(3, 6), (4, 5), (5, 4), (6, 3)}.

$$P(E) = 4/36 = 1/9$$

15. Answer: Option C

Let S be the sample space.

Then, $n(S)$ = number of ways of drawing 3 balls out of 15

$$= {}^{15}C_3$$

$$= \frac{(15 \times 14 \times 13)}{(3 \times 2 \times 1)}$$

$$= 455.$$

Let E = event of getting all the 3 red balls.

$$\therefore n(E) = {}^5C_3 = {}^5C_2 = \frac{(5 \times 4)}{(2 \times 1)} = 10.$$

$$\therefore P(E) = \frac{n(E)}{n(S)} = \frac{10}{455} = \frac{2}{91}.$$

16. Answer: Option B

Explanation:

(a) Since $\log_a a = 1$, so $\log_{10} 10 = 1$.

(b) $\log(2 + 3) = \log 5$ and $\log(2 \times 3) = \log 6 = \log 2 + \log 3$

$$\therefore \log(2 + 3) \neq \log(2 \times 3)$$

(c) Since $\log_a 1 = 0$, so $\log_{10} 1 = 0$.

(d) $\log(1 + 2 + 3) = \log 6 = \log(1 \times 2 \times 3) = \log 1 + \log 2 + \log 3$.

So, (b) is incorrect.

17. Answer: Option C

Man's rate in still water = $(15 - 2.5)$ km/hr = 12.5 km/hr.

Man's rate against the current = $(12.5 - 2.5)$ km/hr = 10 km/hr.

18. Answer: Option D

Let the speed of the boat in still water be x kmph. Then,

Speed downstream = $(x + 3)$ kmph,

Speed upstream = $(x - 3)$ kmph.

$$(x + 3) \times 1 = (x - 3) \times 3/2$$

$$2x + 6 = 3x - 9$$

$$x = 15 \text{ kmph.}$$

19. Answer: Option A

Let the required weight be x kg.

Less weight, Less cost (Direct Proportion)

$$250 : 200 :: 60 : x \Rightarrow 250 \times x = (200 \times 60)$$

$$x = (200 \times 60)/250$$

$$x = 48.$$

20. Answer: Option B



Let the required number of revolutions made by large wheel be x.

Then, More cogs, Less revolutions (Indirect Proportion)

$$14 : 6 :: 21 : x \quad 14 \times x = 6 \times 21$$

$$x = 6 \times 21$$

$$14$$

$$x = 9.$$

21. Answer: Option A

$$\text{Given } \left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$$

$$\Rightarrow \left(\frac{a}{b}\right)^{x-1} = \left(\frac{a}{b}\right)^{-(x-3)} = \left(\frac{a}{b}\right)^{(3-x)}$$

$$\Rightarrow x - 1 = 3 - x$$

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = 2.$$

22. Answer: Option C

$$3^{x-y} = 27 = 3^3 \Leftrightarrow x - y = 3 \dots (i)$$

$$3^{x+y} = 243 = 3^5 \Leftrightarrow x + y = 5 \dots (ii)$$

On solving (i) and (ii), we get $x = 4$.

23. Answer: Option A

N = H.C.F. of (4665 - 1305), (6905 - 4665) and (6905 - 1305)

= H.C.F. of 3360, 2240 and 5600 = 1120.

Sum of digits in $N = (1 + 1 + 2 + 0) = 4$

24. Answer: Option A

Let the average age of the whole team be x years.

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

$$11x - 9x = 46$$

$$2x = 46$$

$$x = 23.$$

So, average age of the team is 23 years.

25. Answer: Option C

On 31st December, 2005 it was Saturday.

Number of odd days from the year 2006 to the year 2009 =

$$(1 + 1 + 2 + 1) = 5 \text{ days.}$$

On 31st December 2009, it was Thursday.

Thus, on 1st Jan, 2010 it is Friday.