

RRB NTPC Previous Year Question Paper 2016

Quantitative Aptitude

Q 1. What per cent of 1 hour is 1 minute and 12 seconds?

1. 2%
2. 12%
3. 11%
4. 1.2%

Answer: 1

Solution 1:

1 hour has 3600 seconds

1 minute has 60 seconds.

1 hour 12 seconds = 60 + 12 = 72 seconds

Required percentage = $(72 / 3600) * 100$

= 2 %

Q 2. How many prime numbers are there between 50 and 100?

1. 6
2. 10
3. 13
4. 5

Answer: 2

Solution 2:

There are 10 prime numbers between 50 and 100. They are given below

53, 59, 61, 67, 71, 73, 79, 89, 97.

Q 3. Calculate the amount of Rs 37,500/- @ 8% per annum compounded half-yearly for one and a half years.

1. Rs 42,182.40
2. Rs 42,000
3. Rs 42,120
4. Rs 42,812.40

Answer: 1

Solution 3:

Formula is

$$P [1 + (r/2) / 100]^{2n}$$

Since the amount is compounded half-yearly rate of interest becomes $r/2$ and due to the same reason, n becomes $2n$.

$$r/2 = 8/2 = 4$$

$$2n = 3$$

Substituting the values in the above equation we get,

$$\begin{aligned} &37,500 [1 + 4/100]^3 \\ &= \text{Rs } 42,182.40 \end{aligned}$$

Q 4. Three bells ring at intervals of 15, 20 and 30 minutes respectively. If they all ring at 11:00 AM together, at what time will they next ring together?

1. 11:30 AM
2. 12 Noon
3. 12:30 PM
4. 1:00 PM

Answer: 2

Solution 4:

To understand when they would ring together we need to find the LCM of 15, 20 and 30. The LCM of the three numbers is 60.

Hence all the bells will ring together after 60 minutes.

So all 3 bells will ring together at 12:00 Noon.

Q 5. A's height is $\frac{5}{8}$ th of B's height. What is the ratio of B's height to A's height?

1. 5:8
2. 3:8
3. 5:3
4. 8:5

Answer: 4

Solution 5:

$$A = \left(\frac{5}{8}\right) * B$$

$$5B = 8A$$

$$B/A = 8/5$$

$$B : A = 8 : 5$$

Q 6. In a company 10 employees get a salary of Rs 36,200/- each and 15 employees get a salary of Rs 33,550/- each. Find the average salary per employee.

1. 34875
2. 34610
3. 27900
4. 36410

Answer: 2

Solution 6:

$$(10 * 36200 + 15 * 33550) / (10 + 15)$$

$$= \text{Rs } 34,610/-$$

Q 7. Ram is 4 times his son's age today. Five years hence, Ram will be thrice his son's age. Find their current ages?

1. 60, 15
2. 40, 10
3. 20, 5
4. 32, 8

Answer: 2

Solution 7:

Let Ram's current age be R

Let his sons current age be S

The relation between their current ages

$$R = 4S$$

5 years hence their ages will be

$$\text{Ram's age after 5 years} = R + 5$$

$$\text{Sons age after 5 years} = S + 5$$

His age will be 3 times his sons' age.

$$R + 5 = 3(S + 5)$$

$$\text{But } R = 4S$$

$$4S + 5 = 3S + 15$$

$$S = 10 \text{ years}$$

Hence substituting the value of S we get

$$R = 40 \text{ years.}$$

Q 8. Meena took a car loan for Rs 2,75,000/- from the bank. She paid an interest of 8% per annum and settled the account after 3 years. At the time of settlement, she gave her old scooter to the bank plus Rs 3,35,000/- What price did the scooter fetch?

1. 60,000
2. 6000
3. 66,000
4. 6,600

Answer: 2

Solution 8:

$$\text{PTR} / 100 = (275000 * 3 * 8) / 100$$

$$= \text{Rs } 66,000$$

$$\text{The total amount she had to pay} = 2,75,000 + 66,000 = \text{Rs } 3,41,000$$

$$3,41,000 - 3,35,000$$

$$= \text{Rs } 6,000/-$$

Hence she was able to fetch Rs 6,000 for the scooter.

Q 9. The distance between 2 places, A and B, is 300 Km. Two riders, on scooters start simultaneously from A and B towards each other. The distance between them after 2.5 hrs is 25 km. If the speed of one scooter is 10 km/hr more than the other, find the speed of each scooter in km/hr.

1. 50 and 60
2. 30 and 40
3. 40 and 50
4. 60 and 70

Answer: 1

Solution 9:

Initially, the distance separating both the scooters was 300 km after 2.5 hours the distance separating them is reduced to 25 km. It means both of them have combined travelled a distance of 275 Km in a span of 2.5 hrs.

Hence we can put it mathematically as

D_1 - distance covered by Scooter 1

D_2 - distance covered by Scooter 2

$$D_1 + D_2 = 275$$

Distance = Speed * time

$$S_1 * t + S_2 * t = 275$$

$$(S_1 + S_2) * t = 275$$

Let one of them have the speed as x km/hr

Then the other scooter will have a speed of $x + 10$ km/hr as mentioned in the question.

Substituting the value of S_1 and S_2 in the above equation we get

$$(X + X + 10) * 2.5 = 275$$

$$(2x + 10) * 2.5 = 275$$

$$X = 50 \text{ Km/hr}$$

Hence the speed of other scooter is $50 + 10 = 60$ Km/hr

Q 10. A tank can be filled by two taps X and Y in 5 hours and 10 hours respectively while another tap Z empties the tank in 20 hours. In how many hours can the tank be filled if all 3 taps are kept open?

1. 5
2. 4
3. 7
4. 8

Answer: 4

Solution 10:

The easiest way to solve such problems is when we internalise fraction percentage conversions.

X can fill in 5 hours.

In 1 hour it can fill $\frac{1}{5} = 20\%$

Y can fill in 10 hours.

In 1 hour it can fill $\frac{1}{10} = 10\%$

Z can empty in 20 hours

In 1 hour it can empty $\frac{1}{20} = 5\%$

Hence the total efficiency in 1 hour

$$= 20 + 10 - 5$$

$$= 25 \%$$

$$25 \% = \frac{1}{4}$$

Therefore when all 3 tanks are open, the tank can be filled in 4 hours.

Q 11. If $\cot A = 12/5$ then $(\sin A + \cos A) \cdot \operatorname{cosec} A$ is?

1. $12/5$
2. $17/5$
3. $11/5$
4. 2

Answer: 2

Solution 11:

$$\cot A = \cos A / \sin A$$

$$\operatorname{cosec} A = 1 / \sin A$$

$$(\sin A + \cos A) / \sin A = 1 + (\cos A / \sin A)$$

$$= 1 + (12 / 5)$$

$$= 17 / 5$$

Q 12. A man sells a table for Rs 4200/- at 25% loss. At what price must he sell to get a profit of 25%.?

1. 1400
2. 8400
3. 7000
4. 5600

Answer: 3

Solution 12:

$$\text{Cost Price of the table} = 4200 / (1 - \frac{1}{4})$$

$$= (4200 * 4) / 3$$

$$= \text{Rs } 5600/-$$

$$\text{Selling Price to fetch a profit of 25\%} = 5600 (1 + \frac{1}{4})$$

$$= 1400 * 5$$

= Rs 7000

Q 13. A man travelling by bus finds that the bus crosses 35 electric poles in 1 minute and the distance between 2 poles is 50 metres. Find the speed of the bus.

1. 112 Km/hr
2. 102 Km/hr
3. 110 Km/hr
4. 120 Km/hr

Answer: 2

Solution 13:

The distance covered by bus in 1 minute = $34 * 50$

= 1700 metres.

1 minute = 60 seconds

Speed = $1700 / 60$ metre/seconds

To convert to Km/hr multiply the fraction by $18/5$

$(1700 / 60) * (18 / 5)$

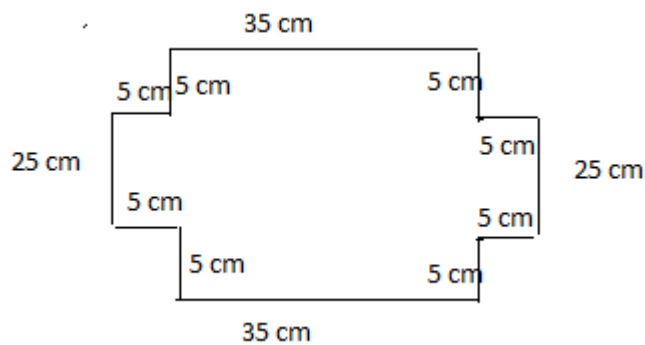
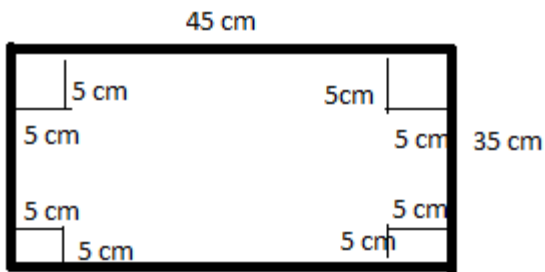
= 102 Km/hr

Q 14. Four square of 5 cm length were cut from corners of a rectangular plate of dimension $45 \text{ cm} \times 35 \text{ cm}$. From the remaining plate, an open box is made. Find the volume of the box.

1. 1200 cm^3
2. 872 cm^3
3. 1325 cm^3
4. 4375 cm^3

Answer: 4

Solution 14:



In the 2nd figure, when the sides of square 5 cm is cut from all corners, length reduces from 45 cm to 35 cm as 5 cm each is cut from 2 extreme ends of the length.

The breadth reduces from 35 cm to 25 cm as 2 squares of side 5 cm each is cut from the extreme ends of breadth.

The Volume of box = length \times breadth \times height.

$$= 35 \times 25 \times 5$$

$$= 4375 \text{ cm}^3$$

Q 15. P purchase an item for Rs 1200 and sold it on a profit of 10%. If he sells it at Rs 1380 then calculate his increase in profit percentage.

1. 5%
2. 10%
3. 12%
4. 15%

Answer: 1

Solution 15:

When an item is sold at 10% profit then

$$\text{Selling Price} = 1200 * (1.1) = \text{Rs } 1320/-$$

New selling price = Rs 1380

$$\text{Profit percentage} = [(1380 - 1200) / 1200] * 100$$

$$= (180 / 1200) * 100$$

$$= 15\%$$

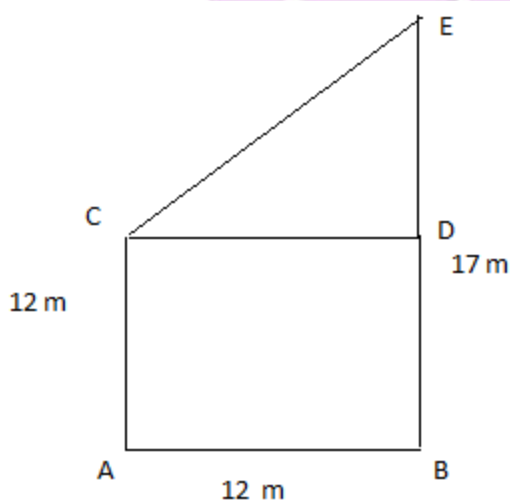
Hence the increase in profit percentage = $15 - 10 = 5\%$

Q 16. The pillars of 12 m and 17 m long are standing on the ground. If the distance between their feet is 12 m then find the distance between their top.

1. 11 m
2. 12 m
3. 13 m
4. 14 m

Answer: 3

Solution 16:



AB = 12 m

Hence $CD = 12$ m

$BE = 17$ m

$ED = 17 - 12 = 5$ m

CDE is a right angled triangle.

By applying Pythagoras theorem

$$CE^2 = CD^2 + DE^2$$

$$= 12^2 + 5^2$$

$$= 144 + 25$$

$$= 169$$

Hence, Distance between the tops $CE = 13$ m

Q 17. Sum of digits of a 2 digit number is 13. If the digits are interchanged then the new number is 27 less than the original number. Find the new number.

1. 85
2. 76
3. 67
4. 58

Answer: 4

Solution 17:

Let the 2 digits number $10x + y$

Sum of digits = $x + y = 13$ ----- Equation 1

When the digits are interchanged the new number is $10y + x$

The new number is 27 less than the original number,

$$10y + x = (10x + y) - 27$$

$$10x + y - (10y + x) = 27$$

$$9x - 9y = 27$$

$$X - y = 3$$
 ----- Equation 2

Solving Equation 1 and 2 we get,

$$2x = 16$$

$$x = 8$$

$$y = 5$$

Hence the new number is $10y + x$

$$= (10 * 5) + 8$$

$$= 50 + 8$$

$$= 58$$

Q 18. A boat travels against the current from City X to City Y and with the current from City Y to City X. If the speed of the boat in still water is 40 km/hr and speed of the current is 10 km/hr then find the average speed of the boat for the entire journey.

1. 36.5 Km/hr
2. 34.5 Km/hr
3. 37.5 Km/hr
4. 33.33 Km/hr

Answer: 3

Solution 18:

When the boat moves in the direction of current then the total speed

$$= \text{Speed of the boat} + \text{Speed of the current}$$

$$= 40 + 10$$

$$= 50 \text{ Km/hr}$$

When the boat moves in the opposite direction then the total speed

$$= \text{Speed of the boat} - \text{Speed of the current}$$

$$= 40 - 10$$

$$= 30 \text{ Km/hr}$$

Now to find the average speed of the 2 speeds we can use the formula

$$\text{Average speed} = 2ab / (a + b)$$

Where a and b are the 2 different speeds

$$\text{Average speed} = 2 * 50 * 30 / (50 + 30)$$

$$= 1300 / 80$$

$$= 37.5 \text{ Km/hr}$$

Q 19. A certain amount is invested at a certain simple interest rate for a period of 6 years. If the amount is invested at 3% more rate then it has fetched Rs 900 more. Find the Principle amount.

1. Rs 3500
2. Rs 4000
3. Rs 4500
4. Rs 5000

Answer: 4

Solution 19:

Let the simple interest be Rs x

The Simple Interest formula

$$X = PTR / 100$$

Where P is Principle, T = time period, R = Rate of interest.

T = 6 years, let Rate of interest be R; then

$$X = 6PR / 100 \text{ ----- (1)}$$

If the rate of interest was 3% more, then Simple Interest would be Rs 900 more,

$$X + 900 = [P * 6 * (R + 3)] / 100$$

$$900 + x = (6PR + 18 P) / 100$$

$$900 + x = (6PR / 100) + 18P / 100$$

From (1) we know that $6PR / 100 = x$

Substituting the value in the above equation we get

$$900 + x = x + (18P / 100)$$

$$900 = 18P / 100$$

$$P = \text{Rs } 5000/-$$

Q 20. P's height is 5 ft and the length of his shadow is 7ft long. He measured the shadow of his school's building to be 42 ft. Find the height of the building.

1. 50 ft
2. 36 ft
3. 30 ft
4. 32 ft

Answer: 3

Solution 20:

We can consider the angle of elevation as θ

$\tan \theta = \text{opposite side} / \text{adjacent side}$

Opposite side = height of the person, adjacent side = length of his shadow.

$$= 5 / 7$$

Similarly for school,

$\tan \theta = \text{Opposite side} / \text{adjacent side}$

Opposite side = Height of the school

Adjacent side = length of the shadow of the school

$$\tan \theta = x / 42$$

$$5 / 7 = x / 42$$

$$X = 30 \text{ ft}$$

Q 21. $84 \ 12 \ 5 \ 6 = 41$

1. $\times, -, \div$
2. $+, \div, -$
3. $+, -, \div$

4. $\div, \times, +$

Answer: 4

Solution 21:

Applying the rule of Bodmas

$$84 \div 12 \times 5 + 6$$

$$= 7 \times 5 + 6$$

$$= 35 + 6$$

$$= 41$$

Q 22. Find the average of the first 20 multiples of 8

1. 78
2. 80
3. 84
4. 82

Answer: 3

Solution 22:

There are 2 ways to solve this problem.

The difference between every term is 8, hence we can say that they are in Arithmetic Progression.

First-term = 8, common difference = 8, hence we can find the 20th term using the formula

$$T_{20} = a + (n - 1)d$$

$$= 8 + (20 - 1)8$$

$$= 8 + 19 * 8$$

$$= 160$$

We can find the Average of Arithmetic Progression using the formula,

$$\text{Average} = (\text{First Term} + \text{Last term}) / 2$$

$$= (8 + 160) / 2$$

$$= 168 / 2$$

$$= 84$$

The other way is to directly find the sum of first 20 terms using the formula

$$S_n = n/2 [2a + (n-1)d]$$

$$S_{20} = (20 / 2) [2*8 + (20 - 1)*8]$$

Therefore the sum of 20 terms = 1680

The average of 20 terms = sum of 20 terms / number of terms

$$= 1680 / 20$$

$$= 84$$

Q 23. A man is 26 years older than his son. After 3 years, his age will be 3 times of his son. Find the present age of the father.

1. 10 years
2. 36 years
3. 32 years
4. 40 years

Answer: 2

Solution 23:

$$M = 26 + S$$

After 3 years the equation of their ages will be

$$M + 3 = 3 (S + 3)$$

Substitute the value of M in the above equation.

$$26 + S + 3 = 3 S + 9$$

$$2S = 20$$

$$S = 10 \text{ years}$$

$$M = 26 + 10$$

= 36 years

Q 24. A 20 metre long stair is standing against a wall making an angle of 60 degrees from the ground. Find the distance between the foot of the stair and wall.

1. 10 m
2. 17.32 m
3. 34.64 m
4. 30 m

Answer: 1

Solution 24:

To find the distance between the foot of the stair and the wall we can use cosine formula which is
= adjacent side/hypotenuse.

Here the adjacent side is the distance between the foot of the wall and the stairs.

The hypotenuse is the length of the stairs.

$$\cos \theta = x / 20$$

$$1 / 2 = x / 20$$

Therefore distance X = 10 m

Q 25. Find the LCM of 13, 19, 21 and 22.

1. 114114
2. 124124
3. 141114
4. 142214

Answer: 1

Solution 25:

Since all the numbers are co-prime to each other

Their LCM will be the product of

$$13 \times 19 \times 21 \times 22$$

= 114114

Q 26. If three numbers are in the ratio 4: 5: 7 and their total is 320, then find the total of the smallest and the largest number.

1. 140
2. 220
3. 240
4. 180

Answer: 2

Solution 26:

Let the three numbers be $4x$, $5x$ and $7x$.

$$4x + 5x + 7x = 320$$

$$16x = 320$$

$$x = 20$$

$$80 + 140 = 220$$

Q 27. P is twice as efficient as Q. Together complete a work in 22 days, Q alone can complete the work in how many days?

1. 33 days
2. 22 days
3. 66 days
4. 99 days

Answer: 3

Solution 27:

$$P + Q = 22$$

$$P = 2Q$$

$$2Q + Q = 22$$

$$3Q = 22$$

$$3Q = 1/22$$

$$Q = 1/66$$

Hence Q alone can complete the work in 66 days.

Q 28. Difference between 2 numbers is 50 and their ratio is 7:2. Find the product of both numbers.

1. 1600
2. 1200
3. 1400
4. 1800

Answer: 3

Solution 28:

Let the 2 numbers be $7x$ and $2x$.

$$7x - 2x = 50$$

$$5x = 50$$

$$x = 10$$

Hence Number 1 = 70 , and number 2 = 20

Product of both numbers = 70×20

$$= 1400$$

Q 29. HCF and LCM of 2 numbers are 7 and 252 respectively. If 1st number is 28 then find the 2nd number.

1. 252
2. 63
3. 126
4. 56

Answer: 2

Solution 29:

$$7 \times 52 = 28 \times x$$

$$X = 63$$

Q 30. The mean of 25 values was 40. But one value was written as 25 instead of 50. The corrected mean is

1. 39
2. 41
3. 40
4. 42

Answer: 2

Solution 30:

Shortcut method:

Difference between 50 and 25 is 25.

Divide this difference with the total number of people.

$$25 / 25 = 1$$

Now add 1 to the old average = $40 + 1 = 41$.

Hence the new average is 41.