TCS NQT Aptitude (Numerical Ability) Questions & Answers - Paper 4

Time & distance

1. The radius of a circular wheel is 3.5 m. The number of revolutions it will make in travelling 11 km is:

A -

600

B -

800

C -

1000

D -

500

Solution

Circumference of the circular wheel = 2 × 22/7 × 3.5 = 22 m

The number of revolution = 11000/22 = 500

Hence, option d.

Ratios & proportions

2. 84 is divided into two parts in such a way that $(1/5)^{th}$ of the first and $(1/6)^{th}$ of the second are in the ratio 3:1, respectively. Find the first part.

A -

60

B -

24

C -

50

D -

64

Solution

Let the first part = x

Second part = 84 – x

According to the question,

(x × 1/5):(84 – x)/6 = 3:1

x/5 = (84 – x)/6 × 3

2x = 420 – 5x

7x = 420

x = 60

First part = 60

Hence, option a.

Averages

3. The average of 12 numbers is 30. The average of first 7 numbers is 24 and that of the last 4 numbers is 36. What is the 8^{th} number?

A -

40

B -

36

C -

56

D -

48

Solution

Sum of 12 numbers = 12 × 30 = 360

Sum of first 7 numbers = 7 × 24 = 168

Sum of last 4 numbers = 4 × 36 = 144

8^{th} number = 360 – 168 – 144 = 48

Hence, option d.

Percentages

4. The number of employees in a company is 240 and the number of male employees in the company is 45%. If 25% of the male employees and 50% of the female employees are married, find the number of employees that are not married.

A -

147

B -

156

C -

162

D -

178

Solution

Total employees in the company = 240

Male employees in the company = 240 × 45% = 108

Female employees in the company = 240 × 55% = 132

Male employees that are married = 108 × 25% = 27

Male employees that are not married = 108 × 75% = 81

Female employees that are married = 132 × 50% = 66

Female employees that are not married = 132 – 66 = 66

Required number of employees = 66 + 81 = 147

Hence, option a.

Problems on trains

5. A train is running with the speed of 54 km/h and crosses a 240 m long platform in 36 seconds. Find the length of the train.
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A -

200 m

B -

360 m

C -

240 m

D -

300 m

Solution

Let the length of the train = x m

According to the question,

54 × 5/18 = (240 + x)/36

15 × 36 = 240 + x

540 – 240 = x

x = 300 m

Hence, option d.

Divisibility rules

6. If the 8-digit number 5963x55y is divisible by 72, then the value of (8x – 2y) is:

A -

4

B -

6

C -

8

D -

5

Solution

If a number if divisible by 72 so it should be divisible by 8 and 9 together.

Last 3 digits should be divisible by 8.

So y = 2

Sum of the digits of the number should be divisible by 9.

(5 + 9 + 6 + 3 + x + 5 + 5 + 2)/9 = (35 + x)/9

So, x = 1

Required value = (8 × 1 – 2 × 2) = 4

Hence, option a.

Time & work

7. A and B together can complete a piece of work in 24 days and A alone can complete the work in 32 days. C is 100% more than efficient than B, find the time taken by C to complete the work alone.

A -

60 days

B -

54 days

C -

32 days

D -

48 days

Solution

Let the total amount of the work = 96 units

Amount of the work done by A and B together in one day = 96/24 = 4 units

Amount of the work done by A in one day = 96/32 = 3 units

Amount of the work done by B in one day = 4 – 3 = 1 unit

Amount of the work done by C in one day = 1 × 200% = 2 units

Time taken by C alone to complete the work alone = 96/2 = 48 days

Hence, option d.

Data interpretation (tabular form on absolute values)

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(8-9) The table given below shows the number of scooters produced by five different companies in five different years.

Companies	2013	2014	2015	2016	2017
A	175	140	165	125	180
B	140	185	160	220	190
C	160	200	215	180	185
D	220	195	150	170	180
E	190	225	210	180	240

8.The number of scooter produced by company A in 2014 is what percent of the total number of scooter produced by all companies in 2016?

A -

20%

B -

24%

C -

16%

D -

28%

Solution

Total number of scooter produced by all companies in 2016 = 125 + 220 + 180 + 170 + 180 = 875

Required percentage = 140/875 × 100 = 16%

Hence, option c.

9. What is the ratio of the number of scooters produced by company A in 2015 and 2017 together to that by company C in 2013 and 2014 together?

A -

23:24

B -

15:16

C -

20:23

D -

18:19

Solution

Required ratio = (165 + 180):(160 + 200) = 345:360 = 23:24

Hence, option a.

Algebra

10. If $x = (\sqrt{5} + 2)^{-1/3}$, find the value of $x^3 - 1/x^3$

A -

0

B -

$\sqrt{5}$

C -

- 4

D -

2

Solution

$x = (\sqrt{5} + 2)^{-1/3}$

$x = 1/(\sqrt{5} + 2)^{1/3}$

$x^3 = 1/(\sqrt{5} + 2)$

$1/x^3 = (\sqrt{5} + 2)$

Again, $x^3 = 1/(\sqrt{5} + 2)$

$x^3 = 1/(\sqrt{5} + 2) \times (\sqrt{5} - 2)/(\sqrt{5} - 2)$

$x^3 = (\sqrt{5} - 2)$

Required Value = $x^3 – 1/x^3$

$= (\sqrt{5} - 2) - (\sqrt{5} + 2)$

$= \sqrt{5} – 2 - \sqrt{5} – 2$

$= - 4$

Hence, option c.

Algebra

11. If $x \neq 0$, $y \neq 0$ and $z \neq 0$, and $1/x^2 + 1/y^2 + 1/z^2 = 1/xy + 1/yz + 1/zx$, what is the relation among x, y and z?

A -

x = y = z

B -

x + y + z = 0

C -

1/x + 1/y + 1/z = 0

D -

x + y = z

Solution

$1/x^2 + 1/y^2 + 1/z^2 = 1/xy + 1/yz + 1/zx$

$1/x^2 - 1/xy + 1/y^2 - 1/yz + 1/z^2 - 1/zx = 0$

1/x(1/x – 1/y) + 1/y(1/y – 1/z) + 1/z(1/z – 1/x) = 0

Solve through option,

Let x = y = z

1/x(1/x – 1/x) + 1/x(1/x – 1/x) + 1/x(1/x – 1/x) = 0

0 = 0

Hence, option a.

Algebra

12. If $(3a + 4)^2 + (6b + 1)^2 + (2c – 3)^2 = 0$, find the value of $(a^3 + b^3 + c^3 – 3abc)/(a^2 + b^2 + c^2) + 5$.

A -

0

B -

3

C -

-1

D -

5

Solution

$(3a + 4)^2 + (6b + 1)^2 + (2c – 3)^2 = 0$

So, $(3a + 4)^2 = (6b + 1)^2 = (2c – 3)^2 = 0$

$a = -4/3, b = -1/6, c = 3/2$

$a + b + c = -4/3 – 1/6 + 3/2$

$= 0$

So, $a^3 + b^3 + c^3 – 3abc = 0$

Required value = $(a^3 + b^3 + c^3 – 3abc)/(a^2 + b^2 + c^2) + 5$

$= 0/(a^2 + b^2 + c^2) + 5$

$= 5$

Hence, option d.

Time & work

13. The work done by a woman in 12 hours is equal to the work done by a man in 15 hours or a boy in 10 hours. If 8 men working 6 hours a day can complete a work in 58 days, then in how many days 6 men, 4 women and 12 boys, together can complete the same work, working 2 hours a day?

A -

40

B -

36

C -

24

D -

48

Solution

According to the question,

12W = 15M = 10B

Or, 4W = 5M and 12B = 18M

Therefore, 6 men + 4 women + 12 boys = 6M + 5M + 18M = 29 men

Let the time taken by 29 men to complete the work be ‘D’ days

Therefore,

(8 × 6 × 58) = (29 × 2 × D)

Or, D = 48

Hence, option d.

Mixtures & allegations

14. In a mixture of (HCl + water), the water content is 40%. When 25% of the mixture is replaced with same quantity of HCl, then the new quantity of HCl will be how much percent of the total mixture?

A -

64%

B -

70%

C -

75%

D -

72%

Solution

Let the initial quantity of HCl and water in the mixture be 3x litres and 2x litres, respectively

According to the question,

New quantity of HCl in the mixture = (0.75 × 3x) + (0.25 × 5x) = 2.25x + 1.25x = 3.5x litres

Required percentage = (3.5x/5x) × 100 = 70%

Hence, option b.

Probability

15. A bag contains 4 red balls, 6 black balls and 8 yellow balls. 3 balls are picked at random. Find the probability that at least one of them is yellow.

A -

25/34

B -

27/34

C -

29/34

D -

21/34

Solution

Number of balls other than yellow = 4 + 6 = 10

Probability of getting balls other than yellow = $^{10}C_3/^{18}C_3$ = 5/34

Therefore, probability of getting a yellow ball = 1 – (5/34) = 29/34

Hence, option c.

Partnership

16. ‘A’, ‘B’ and ‘C’ invested Rs. 12000, Rs. 20000 and Rs. 16000, respectively, in a business together. After 8 months, each of them withdrew Rs. 4000 from their initial investments. At the end of the year, the profit received by ‘A’ is how much percent less than that by ‘B’ and ‘C’ together?

A -

70%

B -

65%

C -

72%

D -

68%

Solution

Respective ratio of the profits received by ‘A’, ‘B’ and ‘C’

{(12000 × 8) + (8000 × 4)}:{(20000 × 8) + (16000 × 4)}:{(16000 × 8) + (12000 × 4)} = 8:14:11

Required percentage = {(11 + 14 – 8)/(11 + 14)} × 100 = 68%

Hence, option d.

Boats & streams

17. A boat can travel 90 km upstream in 6 hours and 155 km downstream in 5 hours. If the speed of the current had been twice, then find the time taken by the boat to cover 195 km in downstream.

A -

4.5 hours

B -

5 hours

C -

8 hours

D -

6 hours

Solution

Let the speed of the boat in still water and the speed of the current be ‘x’ km/hr and ‘y’ km/hr, respectively

According to the question,

(x - y) = 90/6 = 15….. (1)

And, (x + y) = 155/5 = 31….. (2)

On solving equation (1) and (2), we get

Speed of the boat in still water = x = 23 km/hr

And, the speed of the current = y = 8 km/hr

Required time taken = 195/(x + 2y) = 195/39 = 5 hours

Hence, option b.

Ratios & proportions

18. ‘A’, ‘B’ and ‘C’ have some chocolates in the ratio 5:8:3, respectively. If ‘A’ had twice the number of chocolates and ‘C’ had half the number of chocolates, they had originally, then ‘B’ would have 14 chocolates less than total chocolates ‘A’ and ‘C’ would have, together. Find the original number of chocolates all three have.

A -

32

B -

80

C -

64

D -

48

Solution

Let the original number of chocolates ‘A’, ‘B’ and ‘C’ have be 5x, 8x and 3x, respectively

According to the question,

(2 × 5x) + (3x/2) = 8x + 14

Or, 11.5x – 8x = 14

Or, x = 14/3.5 = 4

Required number of chocolates = (5x + 8x + 3x) = 16x = 64

Hence, option c.

Profit & loss

19. An article is marked up by 25% above its cost price. The article is then sold after giving a discount of Rs. 204. If there is a profit of 15%, then find the cost price of the article.

A -

Rs. 2120

B -

Rs. 2040

C -

Rs. 2440

D -

Rs. 2520

Solution

Let the cost price of the article be Rs. x

Therefore, marked price of the article = Rs. 1.25x

Selling price of the article = Rs. 1.15x

According to the question,

1.25x – 1.15x = 204

Or, x = 204/0.1 = 2040

Therefore, cost price of the article = Rs. 2040

Hence, option b.

Problems on ages

20. The present age of ‘A’ is 8 years less than the age of ‘B’ 4 years ago from now. If 4 years hence from now, the age of ‘B’ will be 75% more than that of ‘A’, then find the ratio of their present ages.

A -

4:5

B -

2:3

C -

3:4

D -

1:2

Solution

Let the age of ‘B’ 4 years ago from now be ‘x’ years

Therefore, present age of ‘A’ = (x – 8) years

According to the question,

1.75(x – 8 + 4) = x + 4 + 4

Or, 0.75x = 15

Or, x = 15/0.75 = 20

Therefore, required ratio = (x – 8):(x + 4) = 12:24 = 1:2

Hence, option d.

Percentages

21. In 2018, the total population of a town is 7200. Next year, the population of male increased by 25% and population of female decreased by 20% such that the new population of the town becomes 7920. Find the number of males in the town, in 2018.

A -

3600

B -

4800

C -

5000

D -

4500

Solution

In 2018,

Let the number of males be x

Therefore, number of females = (7200 – x)

According to the question,

1.25x + 0.8(7200 – x) = 7920

Or, 0.45x = 2160

Or, x = 2160/0.45 = 4800

Hence, option b.

Data interpretation (tabular form on percentages)

(22-24) Directions: Answer the questions based on the information given below.

The given table shows the average number of people (male + female) who applied for visa and percentage of people whose visa application is accepted out of total number of people who applied, in five different years.

	Average number of people who applied for visa	Percentage of people whose visa is accepted
2010	1200	75%
2011	1050	60%

2012	750	40%
2013	1600	45%
2014	2000	65%

22.1/3rd of the people whose visa application is accepted in 2010 and 25% of the people whose visa application is accepted in 2011, were males. Find the number of females whose visa application is accepted in 2010 and 2011, together.

A -

2240

B -

2025

C -

2145

D -

2320

Solution

	Total number of people who applied for visa	Number of people whose application is accepted	Number of people whose application is rejected

2010	1200 × 2 = 2400	0.75 × 2400 = 1800	2400 – 1800 = 600
2011	1050 × 2 = 2100	0.6 × 2100 = 1260	2100 – 1260 = 840
2012	750 × 2 = 1500	0.4 × 1500 = 600	1500 – 600 = 900
2013	1600 × 2 = 3200	0.45 × 3200 = 1440	3200 – 1440 = 1760
2014	2000 × 2 = 4000	0.65 × 4000 = 2600	4000 – 2600 = 1400

Required number of females = {(2/3) × 1800} + (0.75 × 1260) = 1200 + 945 = 2145

Hence, option c.

23. Find the ratio of the number of people whose visa application is accepted in 2012 to the number of people whose visa application is rejected in 2010.

A -

4:5

B -

3:2

C -

2:5

D -

1:1

Solution

	Total number of people who applied for visa	Number of people whose application is accepted	Number of people whose application is rejected
2010	1200 × 2 = 2400	0.75 × 2400 = 1800	2400 – 1800 = 600
2011	1050 × 2 = 2100	0.6 × 2100 = 1260	2100 – 1260 = 840
2012	750 × 2 = 1500	0.4 × 1500 = 600	1500 – 600 = 900
2013	1600 × 2 = 3200	0.45 × 3200 = 1440	3200 – 1440 = 1760
2014	2000 × 2 = 4000	0.65 × 4000 = 2600	4000 – 2600 = 1400

Required ratio = 600:600 = 1:1

Hence, option d.

24. Find the difference between the number of people whose visa application is accepted in 2012 and 2014, together and number of people whose visa application is rejected in 2011.

A -

2360

B -

2240

C -

2120

D -

1760

Solution

	Total number of people who applied for visa	Number of people whose application is accepted	Number of people whose application is rejected
2010	1200 × 2 = 2400	0.75 × 2400 = 1800	2400 – 1800 = 600
2011	1050 × 2 = 2100	0.6 × 2100 = 1260	2100 – 1260 = 840
2012	750 × 2 = 1500	0.4 × 1500 = 600	1500 – 600 = 900
2013	1600 × 2 = 3200	0.45 × 3200 = 1440	3200 – 1440 = 1760
2014	2000 × 2 = 4000	0.65 × 4000 = 2600	4000 – 2600 = 1400

Required difference = (600 + 2600) – 840 = 2360

Hence, option a.

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Data interpretation (bar graphs on absolute values)

(25-26) Directions: Answer the questions based on the information given below.

The given bar graph shows the total number of medicines (bottles of syrups + packets of tablets) sold and number of bottles of syrups sold, by five different sellers.

25. Find the average number of packets of tablets sold by sellers ‘B’ and ‘D’.

A -

330

B -

325

C -

315

D -

340

Solution

	Total number of medicines sold	Number of bottles of syrups sold	Number of packets of tablets sold
A	480	320	480 – 320 = 160
B	540	240	540 – 240 = 300
C	640	480	640 – 480 = 160

D	720	360	720 – 360 = 360
E	280	120	280 – 120 = 160

Required average = (300 + 360)/2 = 330

Hence, option a.

26. Out of total number of packets of tablets sold by seller ‘C’, 45% were sold to males and rest to females. Find the number of packets of tablets sold to females, by seller ‘C’.

A -

102

B -

84

C -

96

D -

88

Solution

	Total number of medicines sold	Number of bottles of syrups sold	Number of packets of tablets sold
A	480	320	480 – 320 = 160

B	540	240	540 – 240 = 300
C	640	480	640 – 480 = 160
D	720	360	720 – 360 = 360
E	280	120	280 – 120 = 160

Required number of packets = 0.55 × 160 = 88

Hence, option d.