



Discounts

1) An article is marked up by 120% above its cost price and then sold for Rs. 1320 after giving 20% discount. Find the cost price of the article.

- a) Rs. 600
- b) Rs. 750
- c) Rs. 960
- d) Rs. 840

Correct Choice: b

Solution

Let the cost price of the article be Rs. 'x'

According to the question,

$$2.2 \times 0.8x = 1320$$

$$\text{Or, } x = 1320/1.76 = \text{Rs. } 750$$

Hence, option b.

Time & Work

2) Amar is 4 times more efficient than Amish. Both working together can complete the work in 12 days. Find the number of days taken by Amar to complete the work alone.

- a) 16 days
- b) 15.8 days



c) 12.5 days

d) 14.4 days

Correct Choice: d

Solution

Let the efficiency of Amish be x units/day

Therefore, efficiency of Amar = $4x + x = 5x$ units/day

Total work = $(5x + x) \times 12 = 72x$ units

Time taken by Amar to complete the whole work alone = $72x/5x = 14.4$ days

Hence, option d.

Ratios & Proportions

3) In a bag there are coins of Rs. 1, Rs. 2, 25 paise and 50 paise in the ratio 4:2:5:3, respectively. If the total amount in the bag is Rs. 172. Find the difference between the number of Rs. 1 coins and 50 paise coins.

a) 16

b) 12

c) 18

d) 14

Correct Choice: a

Solution



Let the number of coins of Rs. 1, Rs. 2, 25 paise and 50 paise be $4x$, $2x$, $5x$ and $3x$ respectively

According to the question,

$$4x + (2 \times 2x) + (5x/4) + (3x/2) = 172$$

$$\text{Or, } 16x + 16x + 5x + 6x = 172 \times 4$$

$$\text{Or, } x = (172 \times 4)/43$$

$$\text{Or, } x = 16$$

$$\text{Required difference} = (4x - 3x) = x = 16$$

Hence, option a.

Time & Distance

4) Two cyclists 'A' and 'B' are coming towards each other with a speed of 25 km/hr and 30 km/hr. If both of them meet after 48 minutes after starting and both start at the same time, then find the distance between them at the time they start.

a) 38 km

b) 36 km

c) 42 km

d) 44 km

Correct Choice: d

Solution

$$\text{Required distance} = (25 + 30) \times (48/60) = 44 \text{ km}$$

Hence, option d.



Algebra

5) If $(17/6) + (3x - 14/3) = 5x/2$, then find the value of 'x'.

- a) $11/3$
- b) $16/3$
- c) $17/6$
- d) None of these

Correct Choice: a

Solution

According to the question,

$$\{(5x/2) - 3x\} = (17/6) - (14/3)$$

$$\text{Or, } x = 11/3$$

Hence, option a.

Progressions

6) The 3rd and 7th terms of an arithmetic progression is 143 and 399 respectively. Find its 15th term.

- a) 749
- b) 865
- c) 911



d) 857

Correct Choice: c

Solution

Let the first term and common difference of the series be 'a' and 'd' respectively

According to the question,

$$\{a + (7 - 1)d\} - \{a + (3 - 1)d\} = 399 - 143$$

$$\text{Or, } 4d = 256$$

$$\text{Or, } d = 64$$

$$\text{Therefore, } a = 143 - 128 = 15$$

$$\text{Therefore, } 15^{\text{th}} \text{ term of the series} = a + (15 - 1)d = 911$$

Hence, option c.

Coordinate Geometry

7) Point (2, -1) is midpoint of points A(x, -6) and B(-3, y). Find the value of (x + y).

a) 11

b) -9

c) 15

d) -14

Correct Choice: a

Solution



According to the question,

$$\{x + (-3)\}/2 = 2$$

$$\text{Or, } x = 4 + 3 = 7$$

$$\text{Also, } (-6 + y)/2 = -1$$

$$\text{Or, } y = -2 + 6 = 4$$

$$\text{Therefore, } (x + y) = 11$$

Hence, option a.

Areas

8) The ratio of the length to breadth of a rectangular field is 7:4, respectively. If the total cost of fencing at the rate of Rs. 2.5/m is Rs. 550, then find the area of the field.

a) 56 dam²

b) 28 m²

c) 28 dam²

d) None of these

Correct Choice: c

Solution

Let the length and breadth of the rectangular field be 7x metres and 4x metres respectively

$$\text{Therefore, } 2(7x + 4x) = 550/2.5$$

$$\text{Or, } x = 220/22 = 10 \text{ metres}$$



Therefore, area of the field = $7x \times 4x = 2800 \text{ m}^2 = 28 \text{ dam}^2$

Hence, option c.

Mixtures & Allegations

9) A 18 kg alloy 'A' of tin and copper contains 12 kg tin and rest copper. Alloy 'A' is mixed with alloy 'B' of tin and copper having the ratio 3:2 respectively. If the ratio of tin to copper in final mixture is 5:3, then find the quantity of copper in alloy 'B'.

a) 12 kg

b) 16 kg

c) 10 kg

d) 15 kg

Correct Choice: a

Solution

Let the quantity of tin and copper in alloy 'B' be ' $3x$ ' kg and ' $2x$ ' kg respectively

According to the question,

$$(12 + 3x)/(6 + 2x) = 5/3$$

$$\text{Or, } 36 + 9x = 30 + 10x$$

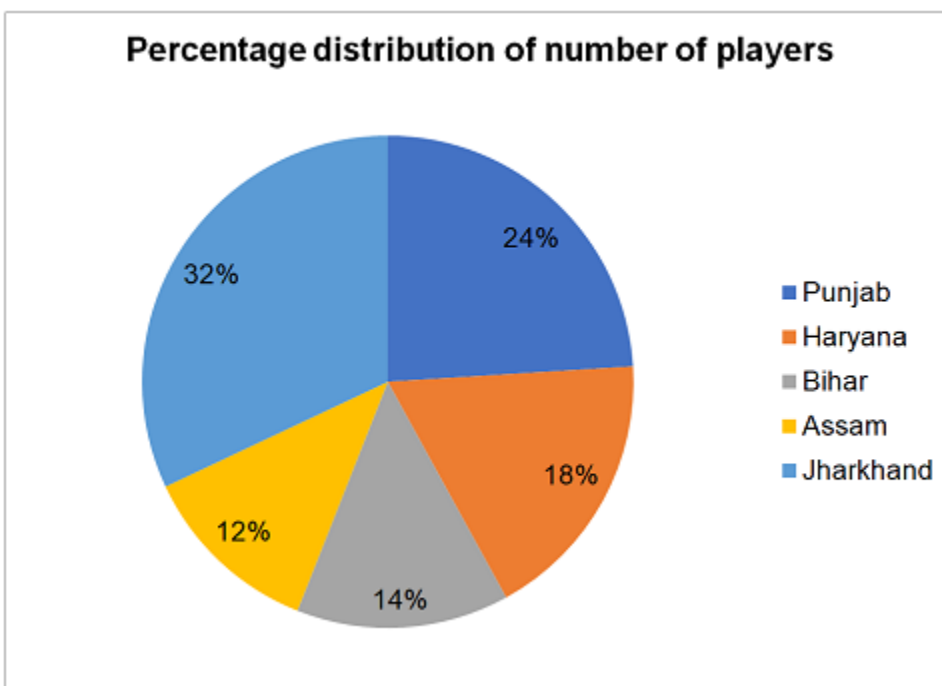
$$\text{Or, } x = 6$$

Therefore, quantity of Copper in alloy 'B' = $2x = 12 \text{ kg}$

Hence, option a.

Data Interpretation (Pie Chart on Percentages)

10) The given pie-chart shows the percentage distribution of 1500 players (boys and girls) from five different states as total number of players from five states together who participated in Khelo India games.



If out of the total number of players from Haryana and Assam $\frac{2}{3}$ rd and $\frac{3}{5}$ th were boys respectively then find the difference between the number of girls who participated from given two states.

- a) 32
- b) 12
- c) 24



d) 18

Correct Choice: d

Solution

$$\text{Required difference} = \left\{ \left(\frac{1}{3} \right) \times 0.18 - \left(\frac{2}{5} \right) \times 0.12 \right\} \times 1500 = 18$$

Hence, option d.

Profit & Loss

11) A milk seller purchased 20 litres of milk at the rate of Rs. 25 per litre. While selling the milk, he added 4 litres of water to it and sold the mixture at the same rate. Find the profit/loss percentage of the milk seller.

a) 15%

b) 20%

c) 25%

d) 18%

Correct Choice: b

Solution

$$\text{Total cost price for the milk seller} = (20 \times 25) = \text{Rs. } 500$$

$$\text{Total selling price for the milk seller} = (20 + 4) \times 25 = \text{Rs. } 600$$

$$\text{Required profit percent} = \left\{ \frac{(600 - 500)}{500} \right\} \times 100 = 20\%$$

Hence, option b.



Data Interpretation(Pie chart on percentages)

12) The given pie-chart shows the percentage distribution of 1500 players (boys and girls) from five different states as total number of players from five states together who participated in Khelo India games.

If 10%, 20%, 30%, 40% and 50% of the players from Punjab, Haryana, Bihar, Assam and Jharkhand won gold medals in games played by them, then find total number of games held. Only these five states participated.

a) 465

b) 540

c) 395

d) 620

Correct Choice: a

Solution

Required number of games = $\{(0.10 \times 0.24) + (0.20 \times 0.18) + (0.30 \times 0.14) + (0.40 \times 0.12) + (0.50 \times 0.32)\} \times 1500 = 465$

Hence, option a.

Problems on Numbers



13) When the numerator and denominator of a fraction is increased by 7 and 13 respectively the fraction becomes $\frac{3}{5}$. Find the fraction if the denominator is 2 more than the numerator.

a) $\frac{3}{5}$

b) $\frac{5}{7}$

c) $\frac{11}{13}$

d) $\frac{7}{9}$

Correct Choice: b

Solution

Let the numerator of the fraction be 'a'

According to the question,

$$\{(a + 7)/(a + 2 + 13)\} = 3/5$$

$$\text{Or, } 5a + 35 = 3a + 45$$

$$\text{Or, } a = 10/2 = 5$$

Required fraction = $\frac{5}{7}$

Hence, option b.

14) 60% of a number is 45% of another number. If the sum of the numbers is 350, then find the difference of the numbers.

a) 50

b) 75

c) 80

d) 45

Correct Choice: a

Solution

Let the numbers be 'x' and 'y' respectively

According to the question,

$$0.60x = 0.45y$$

$$\text{Or, } x/y = 3/4$$

Therefore, $(3 + 4)$ units = 350

Or, 1 unit = 50 units

Therefore, difference = $4 - 3 = 1$ unit = 50

Hence, option a.

Data Interpretation (Tabular Form on percentages)

(15-17) Directions: Answer the questions based on the information given below.

The given table shows the income (in Rs.) of two persons and their percentage expenditure (in accordance to their incomes), in four different years.

	Income of 'A'	Percentage expenditure of 'A'	Income of 'B'	Percentage expenditure of 'B'
2010	45000	60%	32000	75%

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2011	36000	75%	48000	50%
2012	48000	80%	25000	80%
2013	54000	45%	40000	65%

15) Find the ratio of the expenditures of 'A' in 2010 and 2011, together to the savings of 'B' in 2011.

a) 4:1

b) 9:4

c) 3:2

d) 7:5

Correct Choice: b

Solution

In 2010:

Income of 'A' = Rs. 45000

Expenditure of 'A' = 0.6×45000 = Rs. 27000

Expenditure of 'A' = $45000 - 27000$ = Rs. 18000

Similarly,

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	Incom e of 'A'	Expenditur e of 'A'	Saving s of 'A'	Incom e of 'B'	Expenditur e of 'B'	Saving s of 'B'
201 0	45000	27000	18000	32000	24000	8000
201 1	36000	27000	9000	48000	24000	24000
201 2	48000	38400	9600	25000	20000	5000
201 3	54000	24300	29700	40000	26000	14000

Required ratio = $(27000 + 27000):24000 = 9:4$

Hence, option b.

16) Find the difference between savings of 'A' in 2013 and expenditures of 'B' in 2011 and 2013, together.

a) Rs. 24300

b) Rs. 19500

c) Rs. 18400

d) Rs. 20300

Correct Choice: d

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Solution

In 2010:

Income of 'A' = Rs. 45000

Expenditure of 'A' = 0.6×45000 = Rs. 27000

Expenditure of 'A' = $45000 - 27000$ = Rs. 18000

Similarly,

	Incom e of 'A'	Expenditur e of 'A'	Saving s of 'A'	Incom e of 'B'	Expenditur e of 'B'	Saving s of 'B'
201 0	45000	27000	18000	32000	24000	8000
201 1	36000	27000	9000	48000	24000	24000
201 2	48000	38400	9600	25000	20000	5000
201 3	54000	24300	29700	40000	26000	14000

Required difference = $(24000 + 26000) - 29700$ = Rs. 20300

Hence, option e.

17) The expenditure of 'A' in 2012 is how much percent of income of 'B' in 2010 and 2011, together?

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a) 60%

b) 56%

c) 54%

d) 48%

Correct Choice: d

Solution

In 2010:

Income of 'A' = Rs. 45000

Expenditure of 'A' = $0.6 \times 45000 = \text{Rs. } 27000$

Expenditure of 'A' = $45000 - 27000 = \text{Rs. } 18000$

Similarly,

	Income of 'A'	Expenditure of 'A'	Savings of 'A'	Income of 'B'	Expenditure of 'B'	Savings of 'B'
2010	45000	27000	18000	32000	24000	8000
2011	36000	27000	9000	48000	24000	24000
2012	48000	38400	9600	25000	20000	5000
2013	54000	24300	29700	40000	26000	14000



Required percentage = $\{38400/(32000 + 48000)\} \times 100 = 48\%$

Hence, option d.

Time & work

18) 'A' and 'B' together working with 75% of their efficiencies can complete a work together in 20 days while 'A' alone working with his original efficiency takes 48 days to complete the same work. Find the time taken by 'B' alone (working with his original efficiency) to complete 55% of the work.

- a) 10 days
- b) 18 days
- c) 12 days
- d) 15 days

Correct Choice: c

Solution

Let the total work be 240 units

75% of efficiency of (A + B) = $240/20 = 12$ units/day

Original efficiency of 'A' = $240/48 = 5$ units/day

Original efficiency of (A + B) = $12/0.75 = 16$ units/day

Therefore, original efficiency of 'B' = $16 - 5 = 11$ units/day

Required time taken = $0.55 \times (240/11) = 12$ days

Hence, option c.

Mixtures & Allegations



19) A mixture contains paint and oil in the ratio 11:8, respectively. 20% of the mixture is taken out and replaced with 'y' litres of paint and '2y' litres of oil such that the ratio of paint to oil in the resultant mixture becomes 8:9. Find the difference between quantity of oil added and the initial quantity of oil, in the mixture.

- a) 8 liters
- b) 5 liters
- c) 10 liters
- d) None of these

Correct Choice: d

Solution

Let the initial quantity of paint and oil in the mixture be $11x$ litres and $8x$ litres, respectively

According to the question,

$$\{(0.8 \times 11x) + y\} / \{(0.8 \times 8x) + 2y\} = 8/9$$

$$\text{Or, } 79.2x + 9y = 51.2x + 16y$$

$$\text{Or, } 7y = 28x$$

$$\text{Or, } y = 4x$$

$$\text{Or, } 2y = 8x$$

Therefore, quantity of oil added in the mixture = $2y = 8x$ litres

Initial quantity of the oil in the mixture = $8x$ litres

$$\text{Difference} = 8x - 8x = 0$$

Hence, option d.



Partnership

20) 'A', 'B' and 'C' invested Rs. 2400, Rs. 8000 and Rs. 3200, in a business together. After 8 months, 'B' left and 'A' and 'C' added 25% more amount of their initial investments. If the profit received by 'B' at the end of the year is Rs. 12000, then find the total profit received by A, B and C together.

a) Rs. 21320

b) Rs. 25650

c) Rs. 14560

d) Rs. 22840

Correct Choice: b

Solution

Ratio of the profits received by 'A', 'B' and 'C'

$$= \{(2400 \times 8) + (1.25 \times 2400 \times 4)\} : \{(8000 \times 8)\} : \{(3200 \times 8) + (1.25 \times 3200 \times 4)\} = 39:80:52$$

Therefore, required profit received = $12000 \times (39 + 80 + 52)/80 = \text{Rs. } 25650$

Hence, option b.

Areas

21) The sum of the perimeters of an equilateral triangle and a square is 120 cm. If their perimeters are equal then find the area of the square.

a) 256 cm^2



b) 225 cm^2

c) 196 cm^2

d) 400 cm^2

Correct Choice: b

Solution

Let each side of square be 'a' cm

According to the question,

Perimeter of the square = $120/2 = 60 \text{ cm}$

Or, $4a = 60$

Or, $a = 15$

Therefore, area of the square = $15^2 = 225 \text{ cm}^2$

Hence, option b.

Simple Interest – Compound Interest

22) Rs. $(x + 200)$ when invested at 15% p.a. for 8 years gives a simple interest of Rs. $(x + 680)$. Find the amount received when Rs. $(x + 1000)$ is invested at 50% p.a. compound interest for two years, compounded annually.

a) Rs. 5000

b) Rs. 6400

c) Rs. 7200

d) Rs. 8000



Correct Choice: c

Solution

According to the question,

$$\{(x + 200) \times 15 \times 8\}/100 = (x + 680)$$

$$\text{Or, } 1.2x - x = 680 - 240$$

$$\text{Or, } x = 440/0.2 = 2200$$

$$\text{Required amount received} = (x + 1000)(1 + 50/100)^2 = 3200(1 + 50/100)^2 = \text{Rs. } 7200$$

Hence, option c.

Averages

23) The average of three numbers (a, b and c) is 320. 'b' is 25% more than 'a' and 120 less than 'c'. Find the average of 'a' and 'c'.

a) 330

b) 300

c) 350

d) 280

Correct Choice: a

Solution

According to the question,

$$b = 1.25a \text{ and } c = 1.25a + 120$$

According to the question,



$$1.25a + 1.25a + 120 + a = 3 \times 320$$

$$\text{Or, } a = 840/3.5 = 240$$

$$\text{Required average} = (a + 1.25a + 120)/2 = 660/2 = 330$$

Hence, option a.

Problems on Ages

24) The ratio of the ages of 'A' and 'B', 8 years ago from now was 3:2, respectively. If the ratio of their ages 4 years hence from now will be 9:7, respectively, then find the difference between their present ages.

a) 4 years

b) 8 years

c) 2 years

d) 6 years

Correct Choice: b

Solution

Let the ages of 'A' and 'B', 8 years ago from now be $3x$ years and $2x$ years, respectively

According to the question,

$$(3x + 8 + 4) / (2x + 8 + 4) = 9/7$$

$$\text{Or, } 21x + 84 = 18x + 108$$

$$\text{Or, } 3x = 24$$

$$\text{Or, } x = 8$$



Required difference = $3x - 2x = x = 8$ years

Hence, option b.

Percentages

25) In a group of animals (cows + horses), if 40% of cows left and same number of horses join the group, then the number of horses would have been 50% more than that of cows. Find the original percentage of horses in the group of animals.

a) 11.5%

b) 20%

c) 33.33%

d) 16.66%

Correct Choice: c

Solution

When 40% of cows left and same number of horses join:

Let the number of cows be 'x'

Therefore, number of horses = $1.5x$

Total number of animals = $x + 1.5x = 2.5x$

Now, original number of cows = $x/0.6 = 5x/3$

Therefore, original number of horses = $2.5x - (5x/3) = 5x/6$

Required percentage = $\{(5x/6)/2.5x\} \times 100 = 33.33\%$

Hence, option c.



Comparison on Boats & Streams - Q1, Q2

26) In the question, two quantities I and II are given. You have to solve both the quantities to establish the correct relation between Quantity-I and Quantity-II and choose the correct option.

Quantity-I: Boat 'A' can travel 125 km upstream in 12.5 hours and 340 km downstream in 8.5 hours. The speed of the boat in still water is what percent of the speed of the current.

Quantity-II: A boat can travel 110 km downstream in 5 hours. If the speed of the boat in still water is 6 km/hr more than that of current, then the speed of the boat in still water is what percent of the speed of the current.

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- a) Quantity-I > Quantity-II
- b) Quantity-I < Quantity-II
- c) Quantity-I \leq Quantity-II
- d) Quantity-I = Quantity-II or No relation

Correct Choice: b

Solution

Quantity I:

Let the speed of the boat in still water be 'x' km/hr and the speed of the current be 'y' km/hr

According to the question,

$$(x - y) = 125 / 12.5 = 10 \dots \dots (1)$$

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Also, $(x + y) = 34/8.5 = 40 \dots (2)$

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

Speed of the boat in still water = $x = 25$ km/hr

Speed of the current = 15 km/hr

Required percentage = $25/15 \times 100 = 166.67\%$

Quantity II:

Let the speed of the current be 'a' km/hr

Therefore, speed of the boat in still water = $(a + 6)$ km/hr

According to the question, $(a + a + 6) = 110/5 = 22$

Or, $a = 16/2 = 8$

Required percentage = $14/8 \times 100 = 175\%$

Hence, option b.