रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARD
सी ई एन - ०४/२०२५ - CEN - 04/2025
सेक्शन कंट्रोलर की भर्ती / Recruitment of Section Controller

RRB Section Controller 2025

Section Controller · CEN 04/2025 · CBT-1 · Analytical and Mathematical — Topic-wise

English

27 Chapters · 232 Questions · Official Answer Key

About this Compilation

Every **Analytical and Mathematical** question asked across all 4 shifts of the **RRB Section Controller 2025 CBT-1** examination (CEN 04/2025), regrouped by **chapter** instead of by shift, so you can revise one topic end to end. The correct option is marked as per the official answer key.

Sections. The saved Section Controller 2025 paper carries no section labels. In this book the questions of every shift are grouped into the three exam sections (Analytical and Mathematical, Logical incl. Reading Comprehension, Mental Reasoning), assigned from our topic tags, so the Logical / Mental Reasoning counts may differ slightly from the pattern (60 / 20 / 20). Questions are numbered from 1 in this book; the answers are the same official key as in our complete paper book.

1 question without question text. The saved paper record has no question text or figure for it; it is printed with its options and official answer and marked in the text.

8 duplicate questions removed. RRB repeated these word-for-word across different shifts. They appear once here, so a chapter never prints the same question twice - the complete and section-wise books still carry every occurrence.

How to use

- Use the **Index** to jump to any chapter (clickable).
- Within a chapter, questions on the same idea are placed together.
- The correct answer is highlighted in green with a tick.
- The same paper is also available complete and section-wise.



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Arithmetic 8 Questions • Answer Key

Q1 Percentage

The current population of a town is 16,000. It increases by 40% and 25% in two successive years but decreases by 62% in the third year. What is the population of the town at the end of the third year?

A. 10,642
B. 10,638
C. 10,639
D. 10,640 ✓

Q2 Percentage

By how much is 30% of 65 greater than 35% of 50?

A. 1
B. 2 ✓
C. 4
D. 3

Q3 Percentage

By how much is 30% of 65 greater than 35% of 40?

A. 7.5
B. 5.5 ✓
C. 0.5
D. 2.5

Q4 Percentage

A person saves 90% of his income. If his expenditure is ₹600, then his income (in ₹) is:

A. 5400
B. 6080
C. 6040
D. 6000 ✓

Q5 Percentage

An article is currently priced at ₹10,000. Its price increases by 26% in the first year and by 65% in the second year, but then decreases by 20% in the third year. What will be the price (in ₹) of the article at the end of the third year?

A. 16,632 ✓
B. 16,634
C. 16,637
D. 16,628

Q6 Percentage

By how much is 30% of 65 greater than 35% of 30?

A. 4
B. 9 ✓
C. 11
D. 6

Q7 Percentage

An article is currently priced at ₹11,875. Its price increases by 10% in the first year and by 44% in the second year, but then decreases by 30% in the third year. What will be the price of the article at the end of the third year?

A. 13,167 ✓
B. 13,166
C. 13,162
D. 13,168

Q8 Percentage

By how much is 30% of 60 greater than 30% of 35?

A. 9.5
B. 4.5
C. 2.5
D. 7.5 ✓

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Q1 Articles bought/sold profit

If a man bought 8 erasers for ₹4, and sold them at 5 erasers for ₹8, then the gain percentage is:

A. 240%
B. 210%
C. 230%
D. 220% ✓

Q2 Articles bought/sold profit

If a man bought 8 board pins for ₹4, and sold them at 5 board pins for ₹9, then the gain percentage is:

A. 270%
B. 260% ✓
C. 280%
D. 250%

Q3 Profit, loss, discount

A retailer buys an electronic item for ₹230. His overhead expenses are ₹10. He sells the electronic item for ₹480 and makes x% profit. The value of x is:

A. 100 ✓
B. 80
C. 90
D. 120

Q4 Profit, loss, discount

Kavita, Rakesh, and Shalini invested in a business in the ratio 5:8:15. They invested their capitals for 8 months, 7 months and 4 months, respectively. What was the ratio of their profits?

A. 13:14:15
B. 11:14:15
C. 10:14:15 ✓
D. 12:14:15

Q5 Profit, loss, discount

A dealer buys two articles X and Y for ₹500 each. He marks each of them at the same price. He sells X by giving two successive discounts of 31% and 25% and still earns ₹328 as profit. If he sells Y at a single discount of 61%, then what is the profit percentage on Y?

A. 24%
B. 24.8% ✓
C. 23.8%
D. 23%

Q6 Profit, loss, discount

Dev and Tej started a business by investing amounts of ₹2,450 and ₹1,960, respectively. If Dev's share in the profit earned by them is ₹270, what is the total profit (in ₹) earned by them together?

A. 342
B. 443
C. 486 ✓
D. 526

Q7 Profit, loss, discount

A shopkeeper marks an article at ₹x and offers a discount of 70% on it. He sells it for ₹384 after charging a VAT of 60% on the discounted price. What is the value of x?

A. 900
B. 800 ✓
C. 600
D. 1,000

Q8 Profit, loss, discount

Saeed allows two successive discounts of 30% and 10% on the marked price of a pen, which is equal to a single discount of ₹592. Then how much profit (in %) will Saeed get on that pen, if the cost price is ₹900?

A. 11%
B. 12% ✓
C. 13%
D. 10%

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Q9 Profit, loss, discount

A and B started a business with investments in the ratio 5 : 6. After 6 months, A increased his investment by 60% and B decreased his investment by 25%. At the end of the year, the total profit was ₹28,153. Find A's share in the profit.

A. ₹13,616

B. ₹15,574 ✓

C. ₹10,616

D. ₹21,616

Q10 Profit, loss, discount

A dealer buys two articles X and Y for ₹8000 each. He marks each of them at the same price. He sells X by giving two successive discounts of 20% and 35% and still earns ₹616 as profit. If he sells Y at a single discount of 48%, then what is the profit percentage on Y?

A. 6.7%

B. 7%

C. 6%

D. 7.7% ✓

Q11 Profit, loss, discount

A mobile phone is marked at ₹88,500. After applying successive discounts of 8%, 5% and 2%, what will be its final selling price (in ₹), rounded to the nearest integer?

A. 76,781

B. 72,345

C. 74,098

D. 75,802 ✓

Q12 Profit, loss, discount

A man buys 13 identical articles for a total of ₹15. If he sells each of them for ₹1.6, then what is his profit percentage? (Round off your answer to two decimal places.)

A. 28.87%

B. 27.87%

C. 39.67%

D. 38.67% ✓

Q13 Profit, loss, discount

An item is marked 154% higher than its cost price. Even after allowing some discount, the shopkeeper earns a 27% profit. Find the discount percentage allowed by the shopkeeper.

A. 53%

B. 50% ✓

C. 48%

D. 47%

Q14 Profit, loss, discount

A shopkeeper buys an article for ₹2,400 and marks it for sale at a price that gives him 80% profit on his cost price. He, however, gives a 41% discount on the marked price to his customer. Find the actual profit made by the shopkeeper.

A. ₹148.80 ✓

B. ₹147.80

C. ₹146.80

D. ₹149.80

Q15 Profit, loss, discount

A man buys 12 identical articles for a total of ₹20. If he sells each of them for ₹2.1, then what is his profit percentage?

A. 27%

B. 20.63%

C. 26% ✓

D. 21.63%

Q16 Profit, loss, discount

A man incurs a loss of 12% by selling an article for ₹264. If he sells it for ₹495, what will be his gain percentage?

A. 60%

B. 64%

C. 62%

D. 65% ✓

Q17 Profit, loss, discount

A shopkeeper marks an article at 30% above the cost price and allows a discount of 10%. Find his profit percentage.

A. 20%

B. 15%

C. 12%

D. 17% ✓

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Q18 Profit, loss, discount

Amit and Sumit started a business, investing amounts of ₹800 and ₹950, respectively. If Sumit's share in the profit earned by them is ₹570, what is the total profit (in ₹) earned by them together?

A. 1124
B. 900
C. 1050 ✓
D. 1122

Q19 Profit, loss, discount

A shirt is listed at ₹192 with a discount of 25%. What additional percentage discount must be offered to the customer to bring the net price to ₹108?

A. 30%
B. 23%
C. 25% ✓
D. 27%

Q20 Profit, loss, discount

A man incurs a loss of 24% by selling an article for ₹171. If he sells it for ₹234, what will be his gain or loss percentage?

A. Loss, 5%
B. Gain, 1%
C. Loss, 2%
D. Gain, 4% ✓

Q21 Profit, loss, discount

A man buys 12 identical articles for a total of ₹20. If he sells each of them for ₹2.5, then what is his profit percentage?

A. 33.33%
B. 34.33%
C. 50% ✓
D. 51%

Q22 Profit, loss, discount

A shopkeeper marks an article at ₹x and offers a discount of 50% on it. He sells it for ₹252 after charging a VAT of 44% on the discounted price. What is the value of x?

A. 350 ✓
B. 375
C. 800
D. 400

Q23 Profit, loss, discount

A smartphone is offered with two successive discounts of 20% and 10%. If the marked price is ₹25,000, then what is the final selling price?

A. ₹19,000
B. ₹18,500
C. ₹17,500
D. ₹18,000 ✓

Q24 Profit, loss, discount

After successive discounts of 12% and 5% an article was sold for ₹418. What was the original price of the article?

A. ₹516
B. ₹536
C. ₹500 ✓
D. ₹496

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Arithmetic 19 Questions • Answer Key

Q1 Dividing in ratio

A total of ₹14,800 is to be divided among A, B, and C such that 6 times of A's share = 4 times of B's share = 5 times of C's share. Find A's share.

A. ₹3,990
B. ₹4,000 ✓
C. ₹4,076
D. ₹3,867

Q2 Ratio and proportion

The ratio of Ruby and Anita's salary is 4 : 3. Ruby and Anita receive a festival allowance of ₹1,000 and ₹2,000, respectively, in a certain month, which makes the ratio of their salary as 5 : 4. Find the difference in the salaries (in ₹) of Ruby and Anita.

A. 6,500
B. 7,000
C. 6,000 ✓
D. 5,200

Q3 Ratio and proportion

A and B have incomes in the ratio 4:3 and expenditures in the ratio 2:1. If A saves ₹5,000 and B saves ₹6,000, then A's expenditure exceeds B's by how much?

A. ₹4,500 ✓
B. ₹5,000
C. ₹3,500
D. ₹3,000

Q4 Ratio and proportion

The amount of extension in an elastic string varies directly with the weight hung on it. If a weight of 127 gm produces an extension of 2.3 cm, then what weight would produce an extension of 16.1 cm?

A. 889 gm ✓
B. 1048 gm
C. 917 gm
D. 762 gm

Q5 Ratio and proportion

q is the mean proportional of p and r. q^2 is the mean proportional of p^2r and r^3. Find the value of q if p = 169, where p, q, r are natural numbers.

A. 45
B. 52
C. 13 ✓
D. 26

Q6 Ratio and proportion

If x is added to the numbers 2, 8, 1, 5, the resulting numbers, in order, are in proportion. Find the mean proportion of the terms 2x + 1 and 5x - 2.

A. 7
B. 3 ✓
C. 5
D. 1

Q7 Ratio and proportion

The prices of each article of types P, Q, and R are ₹280, ₹180, and ₹110, respectively. Shanu buys articles of each type in the ratio 3 : 2 : 5 for a total of ₹7000. How many articles of type Q did he purchase?

A. 10
B. 6
C. 4
D. 8 ✓

Q8 Ratio and proportion

The fourth proportional of the numbers x, (x+2) and 3x is 33. Find the second proportional; x is a natural number.

A. 18
B. 9
C. 11 ✓
D. 27

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Q9 Ratio and proportion

There are 6,200 candidates appeared in a CAT examination and the ratio of boys to girls in the school is 23 : 39. Find the number of boys appeared in the CAT examination.

A. 2,304
B. 2,293
C. 2,306
D. 2,300 ✓

Q10 Ratio and proportion

If x is inversely proportional to y, and y = 21 when x = 30, find the value of x, when y = 5.

A. 117
B. 126 ✓
C. 135
D. 129

Q11 Ratio and proportion

The number of green balls and red balls in a bag is in the ratio 8:7. If there are a total of 105 balls, how many are red balls?

A. 63
B. 56
C. 32
D. 49 ✓

Q12 Unitary method

A worker earns ₹1,200 for working 8 hours. At the same rate, how much will he earn for working 12 hours?

A. ₹2,200
B. ₹1,400
C. ₹2,000
D. ₹1,800 ✓

Q13 Unitary method

A garrison of 1,210 men has provisions for 16 days. How long (in days) will the provisions last if the garrison be increased by 550 men?

A. 10
B. 12
C. 9
D. 11 ✓

Q14 Unitary method

A fruit vendor buys 7 dozen bananas for ₹378. If he spends ₹72 more to buy additional bananas at the same rate, how many bananas does he buy in total?

A. 90
B. 100 ✓
C. 97
D. 94

Q15 Fourth proportional

Find the fourth proportional to $\frac{1}{3}, \frac{1}{4}$ and $\frac{1}{5}$.

A. $\frac{5}{21}$
B. $\frac{3}{20}$ ✓
C. $\frac{5}{12}$
D. $\frac{4}{15}$

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Q16 Ratio and proportion

If x-1 is the mean proportion between x-2 and x-8 ,then find the value of x.

A. $\frac{15}{7}$

B. $\frac{15}{8}$ ✓

C. $\frac{5}{3}$

D. $\frac{5}{4}$

Q17 Ratio and proportion

Fourth proportion to 12, 18 and 6 is same as the third proportion to 4 and k. What is the positive value of k?

A. 8

B. 6 ✓

C. 4

D. 7

Q18 Ratio and proportion

If x is inversely proportional to y, and y = 2 when x = 7, find the value of x, when y = 37.

A. $\frac{16}{40}$

B. $\frac{14}{38}$

C. $\frac{15}{38}$

D. $\frac{14}{37}$ ✓

Q19 Unitary method

If 135 kg of corn feeds 45 horses for 8 days, for how long will the same quantity of corn feed 24 horses?

A. 15 days ✓

B. 18 days

C. 13 days

D. 17 days

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Arithmetic 7 Questions • Answer Key

Q1 Mixture and alligation

In what ratio must a grocer mix two varieties of wheat worth ₹94 per kg and ₹116 per kg, so that if he sells the mixture at ₹144 per kg, he may gain 44%?

A. 9:4
B. 7:3
C. 8:3 ✓
D. 5:2

Q2 Mixture and alligation

Pure ghee costs ₹120 per kg. After adulterating it with vegetable oil costing ₹60 per kg, a shopkeeper sells the mixture at the rate of ₹98 per kg, thereby making a profit of 40%. In what ratio does he mix the two?

A. 2 : 7
B. 3 : 7
C. 1 : 5 ✓
D. 2 : 5

Q3 Mixture and alligation

A man adds water to milk to gain profit. He mixes water with milk worth ₹70/litre to get a final mixture costing ₹55/litre. What is the ratio of milk to water in the mixture?

A. 8 : 3
B. 9 : 4
C. 12 : 5
D. 11 : 3 ✓

Q4 Mixture and alligation

In what ratio must a grocer mix two varieties of rice worth ₹66 per kg and ₹108 per kg, so that if he sells the mixture at ₹143 per kg, he may gain 43%?

A. 7:11
B. 3:16
C. 1:3
D. 4:17 ✓

Q5 Mixture and alligation

In what ratio must a grocer mix two varieties of wheat worth ₹68 per kg and ₹128 per kg, so that if he sells the mixture at ₹138 per kg, he may gain 38%?

A. 7:8 ✓
B. 1:1
C. 15:17
D. 17:13

Q6 Mixture and alligation

Three varieties of wheat are mixed in the ratio (weight in kgs) of 4:5:8. When 5 kg of the first variety, 10 kg of the second variety and P kg of the third variety are added to the mixture, the ratio becomes 5:7:9. Find the value of P.

A. 5.5
B. 5 ✓
C. 4.5
D. 4

Q7 Mixture and alligation

In what ratio must a grocer mix two varieties of rice worth ₹65 per kg and ₹89 per kg, so that if he sells the mixture at ₹123 per kg, he may gain 64%?

A. 17:10
B. 3:2
C. 9:7
D. 7:5 ✓

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Q1 Average

At a health club, 55% of the members are women and 45% of the members are men. If the average age of the men is 50 years and the average age of the women is 40 years, what is the average age (in years) of all the members?

- A. 44.5 ✓
- B. 44.9
- C. 43.6
- D. 43.8

Q2 Average

The average height of 15 boys out of a class of 60 boys is 164 cm. If the average height of the remaining boys is 169 cm, then the average height of the whole class (in cm) is:

- A. 167.5
- B. 168.75
- C. 167.75 ✓
- D. 166.5

Q3 Average

The average of the numbers 6.5, 10.6, 20.3 and a is 18. The value of a is:

- A. 34.6 ✓
- B. 36.6
- C. 33.6
- D. 35.6

Q4 Average

The average of 8 numbers is 59. If each number is increased by 6, what will the new average be?

- A. 71
- B. 65 ✓
- C. 59
- D. 8

Q5 Average

The average height of 16 boys out of a class of 50 boys is 160 cm. If the average height of the remaining boys is 168 cm, then the average height of the whole class (in cm) is:

- A. 164
- B. 165.44 ✓
- C. 166.44
- D. 165

Q6 Average

The average of 41 numbers is 36. The average of the first 19 numbers is 57 and the average of the last 23 numbers is 30. If the 19^{th} number from the beginning is excluded, then what is the average of the remaining numbers?

- A. 27.1
- B. 33.689
- C. 29.475 ✓
- D. 25.25

Q7 Average

At a health club, 44% of the members are women and 56% of the members are men. If the average age of the men is 52 years and the average age of the women is 67 years, what is the average age (in years) of all the members?

- A. 68.4
- B. 56.5
- C. 58.6 ✓
- D. 66.4

Q8 Average

The average height of 16 boys out of a class of 50 boys is 160 cm. If the average height of the remaining boys is 167 cm, then the average height of the whole class (in cm) is:

- A. 165.76
- B. 164.76 ✓
- C. 163.5
- D. 164.5

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Q9 Average

The average of 41 numbers is 42. The average of the first 13 numbers is 70 and the average of the last 29 numbers is 81. If the 13^{th} number from the beginning is excluded, then what is the average of the remaining numbers?

A. 10.5

B. 0.86

C. 4.625 ✓

D. 2.268

Q10 Average

At a health club, 54% of the members are women and 46% of the members are men. If the average age of the men is 45 years and the average age of the women is 50 years, what is the average age (in years) of all the members?

A. 47.7 ✓

B. 47.2

C. 46.8

D. 46.4

Q11 Average after change

The average of 8 numbers is 59. If each number is increased by 4, what will the new average be?

A. 59

B. 8

C. 63 ✓

D. 67

Q12 Average after change

The average of 7 numbers is 57. If each number is increased by 7, what will the new average be?

A. 8

B. 57

C. 64 ✓

D. 71

Q13 Average after change

The average of 8 numbers is 59. If each number is increased by 7, what will the new average be?

A. 73

B. 59

C. 66 ✓

D. 8

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Arithmetic 6 Questions • Answer Key

Q1 Time and work

To complete a project, 12 men work for 10 days, working 9 hours per day. How many hours per day should 16 men work to finish the project in 5 days?

A. 12.5
B. 10.5
C. 11.5
D. 13.5 ✓

Q2 Time and work

A can complete a piece of work in 57 days. B is 80% less efficient than A. C is 50% more efficient than B. B and C work together for 54 days. A alone will complete the remaining work in:

A. 27 days
B. 30 days ✓
C. 26 days
D. 35 days

Q3 Time and work

A and B can do a work in 2 days. If A alone can do it in 4 days, then in how many days can B alone do 70-times of the same work?

A. 280 ✓
B. 260
C. 272
D. 281

Q4 Time and work

A can complete a piece of work in 90 days. B is 80% less efficient than A. C is 50% more efficient than B. B and C work together for 36 days. A alone will complete the remaining work in:

A. 67 days
B. 72 days ✓
C. 71 days
D. 77 days

Q5 Time and work

A can complete a piece of work in 21 days and B can complete it in 11 days. If they work on alternate days, starting with B on the first day, then in how many days will the work be completed?

A. 14
B. $15\frac{1}{3}$
C. 15
D. $14\frac{1}{3}$ ✓

Q6 Time and work

A can complete a piece of work in 12 days and B can complete it in 18 days. If they work on alternate days, starting with B on the first day, then in how many days will the work be completed?

A. 15
B. $15\frac{1}{2}$
C. 14
D. $14\frac{1}{2}$ ✓

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Arithmetic 2 Questions • Answer Key

Q1 Pipes and cistern

Two taps can fill a cistern in 3 hours and 48 hours, respectively. A third tap can empty the filled cistern in 48 hours. How long (in hours) will it take to fill two-third of the empty cistern if all of them are opened together?

A. 4
B. 8
C. 6
D. 2 ✓

Q2 Pipes and cistern

Two taps can fill a cistern in 3 hours and 49 hours, respectively. A third tap can empty the filled cistern in 49 hours. How long (in hours) will it take to fill two-third of the empty cistern if all of them are opened together?

A. 8
B. 4
C. 2 ✓
D. 6

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Arithmetic 9 Questions • Answer Key

Q1 Circular track

On a 2295 m long circular track, Siddharth finishes one round in 85 seconds and Yash finishes one round in 45 seconds. How many different meeting points are there on the track if they are running in the opposite directions?

A. 20
B. 36
C. 26 ✓
D. 33

Q2 Speed and distance

If a man travels at the rate of 12 kmph, he misses a train by 7 minutes. However, if he travels at the rate of 30 kmph, he reaches the station 5 minutes before the arrival of the train. Find the distance covered by him to reach the station.

A. 8 km
B. 12 km
C. 4 km ✓
D. 14 km

Q3 Speed and distance

In a circular race of 2715 m, Abhay and Bharti start from the same point and at the same time with speeds of 20 km/h and 34 km/h, respectively. After how long will they meet again for the first time on the track when they are running in the opposite directions?

A. 178 seconds
B. 186 seconds
C. 187 seconds
D. 181 seconds ✓

Q4 Speed and distance

A train P going at the speed of 33 km/h completely passes train Q of length 452 m, going in the same direction on parallel tracks, at 24 km/h, in 9.5 minutes. How much time (in seconds) will P take to completely cross train R of length 482 m, going at 21 km/h in the opposite direction?

A. 97 ✓
B. 112
C. 96
D. 83

Q5 Speed and distance

Two trains, 280 meters and 290 meters in length, are running in opposite directions. The first train runs at the rate of 60 km/h and the second train at the rate of 48 km/h. How long will they take to cross each other?

A. 25 seconds
B. 12 seconds
C. 19 seconds ✓
D. 17 seconds

Q6 Speed and distance

The ratio of the speed of a boat in still water to the speed of a stream is 16:5. A boat goes 16.5 km upstream in 45 minutes. Find the time (in minutes) taken by the boat to cover 17.5 km downstream.

A. 30
B. 25 ✓
C. 22
D. 27

Q7 Speed and distance

If a man travels at the rate of 48 kmph, he misses a train by 19 minutes. However, if he travels at the rate of 50 kmph, he reaches the station 8 minutes before the arrival of the train. Find the distance covered by him to reach the station.

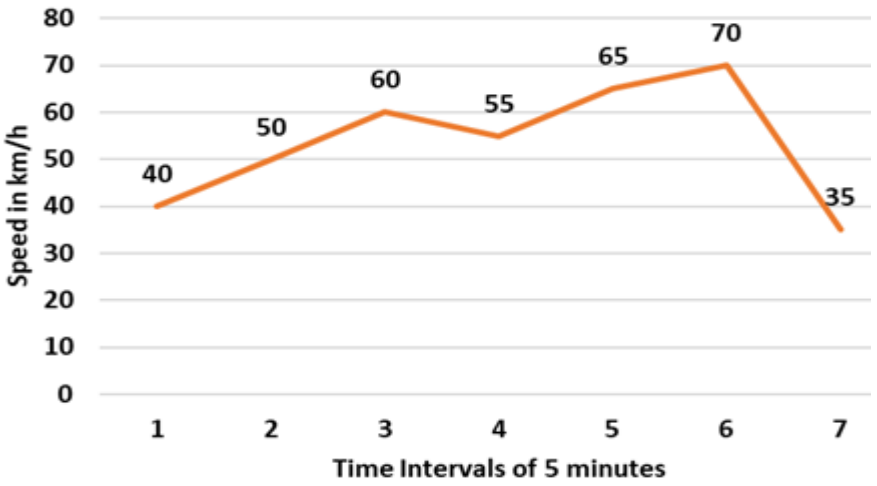
A. 540 km ✓
B. 531 km
C. 534 km
D. 546 km

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Q8 Speed and distance

The graph depicts the speed at which Rishi travels to office, where on the X-axis the intervals mentioned are at the end of every 5 minutes. What is the time taken (in minutes) for Rishi's constant increase of speed from 55 km/h to a speed of 70 km/h?



A. 15

B. 20

C. 5

D. 10 ✓

Q9 Usual time late

Walking at $\frac{2}{5}$ of his normal speed from his home, Bhavesh is 30 minutes late in reaching his office.

The usual time taken by him to cover the distance between his home and his office is:

A. 11 minutes

B. 19 minutes

C. 16 minutes

D. 20 minutes ✓

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Arithmetic 2 Questions • Answer Key

Q1 Ages

The sum of the present ages of Hitesh and Jitesh is 96 years. After 2 years from now, Hitesh's age will be three times that of Jitesh. Hitesh's present age (in years) is:

A. 76
B. 67
C. 75
D. 73 ✓

Q2 Ages

The sum of the present ages of Lokesh and Taresh is 28 years. After 2 years from now, Lokesh's age will be three times that of Taresh. Lokesh's present age (in years) is:

A. 24
B. 19
C. 22 ✓
D. 16

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Algebra

6 Questions • Answer Key

Q1 Linear equations

3 chairs and 15 tables cost ₹6300 and 7 chairs and 12 tables cost ₹7800. What is the cost of 11 chairs and 16 tables?

A. ₹11404
B. ₹11397
C. ₹11398
D. ₹11400 ✓

Q2 Linear equations

10 chairs and 5 tables cost ₹2400 and 16 chairs and 6 tables cost ₹3200. What is the cost of 5 chairs and 7 tables?

A. ₹2642
B. ₹2637
C. ₹2638
D. ₹2640 ✓

Q3 Sum and product

The sum of two positive numbers is 32 and their product is 112. The positive difference between them is:

A. 18
B. 20
C. 22
D. 24 ✓

Q4 Sum and product

The sum of two positive numbers is 59 and their product is 564. The positive difference between them is:

A. 55
B. 47
C. 35 ✓
D. 34

Q5 Sum and product

The sum of two positive numbers is 76 and their product is 1408. The positive difference between them is:

A. 8
B. 5
C. 9
D. 12 ✓

Q6 Sum and product

The sum of two positive numbers is 40 and their product is 76. The positive difference between them is:

A. 36 ✓
B. 49
C. 42
D. 26

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Algebra 4 Questions • Answer Key

Q1 Laws of indices

$$\text{The simplified value of } \frac{(98^6 \times 18^{14} \times 2^{15})}{(98^5 \times 18^{13} \times 2^{13})} \text{ is}$$

A. 7056 ✓

B. 7051

C. 7055

D. 7058

Q2 Laws of indices

$$\text{The simplified value of } \frac{(63^{10} \times 2^{13} \times 28^{19})}{(63^9 \times 2^{12} \times 28^{18})} \text{ is}$$

A. 3536

B. 3528 ✓

C. 3530

D. 3527

Q3 Laws of indices

$$\left(\frac{17}{2}\right)^4 \times \left(\frac{2}{17}\right)^6 \times \left(\frac{17}{2}\right)^3 = \left(\frac{2}{17}\right)^{4m+16}$$

A. $-\frac{15}{4}$

B. $-\frac{9}{4}$

C. $-\frac{17}{4}$ ✓

D. $-\frac{13}{4}$

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Q4 Laws of indices

$$\textit{The simplified value of } \frac{(38^6 \times 2^4 \times 96^{16})}{(38^5 \times 2^3 \times 96^{15})} \textit{ is}$$

A. 7296 ✓

B. 7301

C. 7290

D. 7295

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Algebra 8 Questions • Answer Key

Q1 Roots simplification

$$\frac{\sqrt[3]{2197}}{\sqrt[4]{10000}} \times \frac{5}{39} \times 24 = ?$$

A. 2

B. 6

C. 4 ✓

D. 8

Q2 Simplification

The simplified value of $\frac{16}{45} \times (98 + 20) + 97$ *is*

A. $\frac{6253}{45}$ ✓

B. $\frac{6262}{45}$

C. $\frac{6256}{45}$

D. $\frac{6257}{45}$

Q3 Simplification

The simplified value of 83 - [84 - (96 ÷ 4 - (16 - 36 ÷ 9) ÷ 2)] is:

A. 14

B. 17 ✓

C. 22

D. 18

Q4 Simplification

Simplify: $\sqrt{289} + \sqrt{0.0289} - \sqrt{4.84}$

A. 1.11

B. 8.19

C. 14.97 ✓

D. 8.76

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Q5 Simplification

The simplified value of 81 - [54 - (56 ÷ 8 - (18 - 32 ÷ 4) ÷ 4)] is:

A. $\frac{63}{2}$ ✓

B. $\frac{73}{2}$

C. $\frac{65}{2}$

D. $\frac{71}{2}$

Q6 Simplification

Find the value of y, *satisfying* $23 \times 7 \times 616 \div \sqrt{3136} = y + 506$

A. 1271

B. 1265 ✓

C. 1275

D. 1256

Q7 Simplification

The simplified value of 55 - [76 - (54 ÷ 6 - (14 - 24 ÷ 2) ÷ 9)] is:

A. $-\frac{100}{9}$

B. $-\frac{106}{9}$

C. $-\frac{110}{9}$ ✓

D. $-\frac{119}{9}$

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Q8 Simplification

The simplified value of 52 - [71 - (66 ÷ 6 - (13 - 28 ÷ 7) ÷ 5)] is:

A. $-\frac{48}{5}$

B. $-\frac{52}{5}$

C. $-\frac{49}{5}$ ✓

D. $-\frac{56}{5}$

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Geometry 3 Questions • Answer Key

Q1 Lines and angles

AB is parallel to CD. A transversal PQ intersects AB and CD at E and F, respectively, and ∠PEB = 49°. G is a point between AB and CD such that ∠BEG = 29° and ∠GFE = 24°. What is the measure of ∠EGF?

A. 62°

B. 66°

C. 54° ✓

D. 60°

Q2 Lines and angles

AB is parallel to CD. A transversal PQ intersects AB and CD at E and F, respectively, and ∠PEB = 65°. G is a point between AB and CD such that ∠BEG = 22° and ∠GFE = 12°. What is the measure of ∠EGF?

A. 73°

B. 75° ✓

C. 88°

D. 63°

Q3 Parallel lines angles

AB and CD are two parallel lines. PQ is a transversal line that intersects AB and CD at L and N, respectively. If $\angle PLB = (2x)^\circ$, $\angle BLQ = (y + 4x)^\circ$, $\angle DNQ = (x + 2y)^\circ$, find the value of y.

A. 30

B. 60 ✓

C. 15

D. 20

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Geometry 3 Questions • Answer Key

Q1 Circumradius

If the sides of a triangle are 12 cm, 35 cm and 37 cm, then the circum radius is:

A. 17.0 cm

B. 18.5 cm ✓

C. 16.0 cm

D. 16.5 cm

Q2 Incentre angle

In a ΔLMN, $\angle LMN = 67°$ and $\angle LNM = 42°$. If P is the incentre of the ΔLMN, then what is the measure of $\angle MPN$?

A. 125°

B. 125.5° ✓

C. 120°

D. 120.5°

Q3 Similar triangles

$\angle BAD = \angle EAC$

A. $BC = BA$

B. $BC < DE$

C. $BC > DE$

D. $BC = DE$ ✓

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Geometry 5 Questions • Answer Key

Q1 Circles

Two circles with centres O and O′, with radii 6 cm and 8 cm, respectively, intersect at two points A and B. If OA is a tangent to the circle with centre O′ and vice versa, what is the length of the common chord AB?

A. 11.44 cm

B. 9.60 cm ✓

C. 13.55 cm

D. 14.23 cm

Q2 Circle angles (figure)

[Question text / figure not saved in the source paper record. Options and official answer as released.]

A. $\angle DPE$ has measurement of 84° ✓

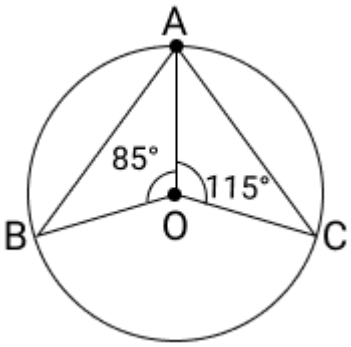
B. $\angle EOD$ is a right angle

C. $\angle ROQ$ has measurement of 116°

D. $\angle PQR + \angle PRQ = 120^\circ$

Q3 Circles

In the given figure, O is the centre of the circle. Find ∠BAC.



A. 65°

B. 84°

C. 72°

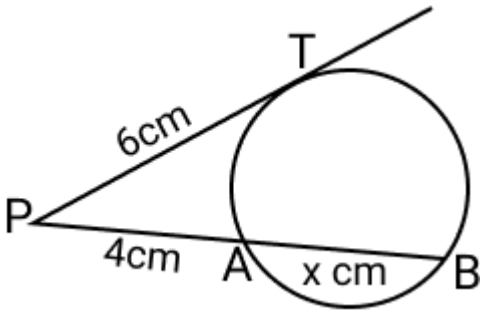
D. 80° ✓

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Q4 Circles

In the given figure, PAB is a secant and PT is a tangent to the circle from P. If PT = 6 cm, PA = 4 cm and AB = x cm, then x is equal to:



A. 5 ✓

B. 4

C. 3

D. 6

Q5 Triangle in semicircle

On the diameter AB of a circle with radius 7 units, a triangle ABC is made. The vertex C lies on the circle and the ratio of two adjacent sides at C is 2:3. What is the area of the triangle ABC in square units?

A. $\frac{589}{15}$

B. $\frac{599}{13}$

C. $\frac{588}{13}$ ✓

D. $\frac{587}{15}$

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Mensuration

9 Questions • Answer Key

Q1 2D mensuration

Two triangles have the same base of 24 cm. The ratio of their heights is 5 : 7 and the sum of their areas is 1728 cm^2. What is the height of the larger triangle?

A. 90 cm

B. 72 cm

C. 78 cm

D. 84 cm ✓

Q2 2D mensuration

The perimeter of an isosceles triangle is 36 cm and the altitude to its base is 12 cm. Find the area of the triangle (in cm^2).

A. 90

B. 140

C. 120

D. 60 ✓

Q3 2D mensuration

If the perimeter of a square and rectangle are 40 cm each and the difference in their areas is 4 cm^2, find the difference between the length and breadth of the rectangle (in cm).

A. 8

B. 6

C. 2

D. 4 ✓

Q4 Areas of squares

Given the ratio of the perimeters of two squares is 7:11, find the ratio of their areas.

A. 121:7

B. 121:49

C. 7:121

D. 49:121 ✓

Q5 2D mensuration

A circular ground has a radius of 42 meters. A running track surrounds this ground, and it is 7 meters wide. Find the outer perimeter of the running track. (Use $\pi = \frac{22}{7}$)

A. 154 meters

B. 308 meters ✓

C. 254 meters

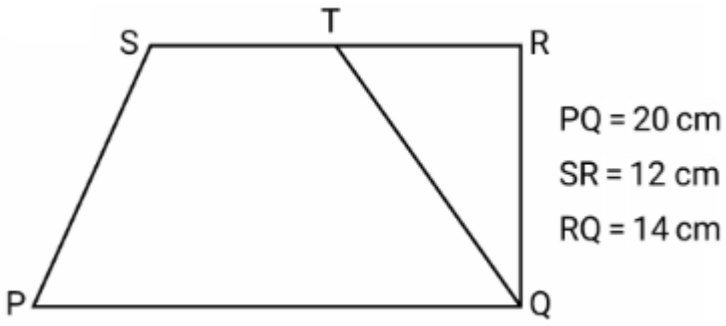
D. 224 meters

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Q6 2D mensuration

In the following figure PQRS, PQ ∥ RS and angle R = 90°. If the area of triangle QRT = 42 cm^2, then find the area of PQST (in cm^2).



A. 182 ✓

B. 204

C. 220

D. 198

Q7 2D mensuration

Find the area of the triangle whose sides are in the ratio of 7:4:8 with a perimeter of 38 cm.

A. $\sqrt{2135}\ cm^2$

B. $\sqrt{3135}\ cm^2$ ✓

C. $55\ cm^2$

D. $60\ cm^2$

Q8 2D mensuration

A rectangular cardboard sheet measures 14 cm in length and 11 cm in width. From each of the two longer sides (each 14 cm), three equilateral triangles of side 2 cm are cut out. From each of the two shorter sides (each 11 cm), a semicircle is cut out, such that none of the triangles or semicircles overlap with one another. If the perimeter of the cardboard after all these cuttings is 70 cm, find the radius (in cm) of each semicircle cut out.

$\left(\text{Use } \pi = \frac{22}{7}\right)$.

A. 3.5 ✓

B. 1.75

C. 10.5

D. 7

Q9 2D mensuration

Find the area of a plot which is in the shape of a quadrilateral, one of whose diagonals is 20 m and lengths of the perpendiculars from the opposite corners on it are of lengths 12 m and 18 m, respectively.

A. $340\ m^2$

B. $300\ m^2$ ✓

C. $298\ m^2$

D. $324\ m^2$

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Mensuration

30 Questions • Answer Key

Q1 3D mensuration

The circumference of the base of a cylindrical vessel is 220 cm and its height is 60 cm. How many litres of water can it hold?

- A. 216
- B. 231 ✓
- C. 233
- D. 202

Q2 3D mensuration

A brick measures 5 m in length, 4 m in breadth and 3 cm in height. How many bricks will be used to make a wall of length 15 m, breadth 20 m and height 4 m?

- A. 2,000 ✓
- B. 20,000
- C. 20
- D. 200

Q3 3D mensuration

The circumference of the base of a cylindrical vessel is 440 cm and its height is 25 cm. How many litres of water can it hold?

- A. 399
- B. 385 ✓
- C. 349
- D. 424

Q4 3D mensuration

Calculate the volume of a cube whose side length is 23 millimetres.

- A. 12,167 mm3 ✓
- B. 12,157 mm3
- C. 12,147 mm3
- D. 12,177 mm3

Q5 3D mensuration

The circumference of the base of a cylindrical vessel is 300 cm and its height is 88 cm. How many litres of water can it hold?

- A. 630 ✓
- B. 679
- C. 582
- D. 645

Q6 3D mensuration

The area of the base of a right circular cone is 2464 cm^2 and its height is 45 cm. What is the curved surface area of the cone?
(Use π = 22/7)

- A. 4224 cm2
- B. 3646 cm2
- C. 4664 cm2 ✓
- D. 5058 cm2

Q7 3D mensuration

A solid hemisphere of radius 14 cm is melted and recast into small hemispheres each of radius 7 cm. How many small hemispheres are formed?

- A. 6
- B. 8 ✓
- C. 16
- D. 27

Q8 3D mensuration

A cuboid of dimension 48 cm by 80 cm by 96 cm is to be divided in to identical cubes. With the maximum possible value of side of the identical cube possible, find the total volume of all the cubes (in cm^3).

- A. 2,14,230
- B. 5,52,960
- C. 1,61,440
- D. 3,68,640 ✓

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Q9 3D mensuration

The volume of a cube is 1728 cm^3. What is the surface area of the cube?

- A. 864 cm2 ✓
- B. 872 cm2
- C. 868 cm2
- D. 664 cm2

Q10 3D mensuration

The circumference of the base of a cylindrical vessel is 440 cm and its height is 60 cm. How many litres of water can it hold?

- A. 924 ✓
- B. 928
- C. 936
- D. 886

Q11 3D mensuration

The total surface area (in m^2) of a cube, each of whose edges measures 238 m, is:

- A. 339882
- B. 339852
- C. 339834
- D. 339864 ✓

Q12 3D mensuration

A right circular cone and a right circular cylinder have equal base and equal height. If the radius of the base and the height are in the ratio 12 : 5, then the ratio of the total surface area of the cylinder to that of the cone is:

- A. 35 : 24
- B. 29 : 21
- C. 34 : 25 ✓
- D. 33 : 26

Q13 3D mensuration

A solid metallic sphere of radius 21 cm is melted and recast into a cone with base radius 14 cm and a cylinder with radius 7 cm. If the heights of the cone and cylinder are equal, what is their common height?

- A. 108 cm ✓
- B. 106 cm
- C. 104 cm
- D. 105 cm

Q14 3D mensuration

A sector is formed by opening out a cone of a base radius of 12 cm and a height of 9 cm. Then the radius of the sector is:

- A. 12 cm
- B. 6 cm
- C. 9 cm
- D. 15 cm ✓

Q15 Cone-cylinder ratio

A right circular cone and a right circular cylinder have equal base and equal height. If the radius of the base and the height are in the ratio 5 : 12, then the ratio of the total surface area of the cylinder to that of the cone is:

- A. 0.5875
- B. 16 : 5
- C. 12 : 4
- D. 17 : 9 ✓

Q16 Cone-cylinder volume ratio

The ratio of the heights of a right circular cone and a right circular cylinder is 2 : 9 and the ratio of the radii of their bases is 7 : 2. If the volume of the cylinder is 972 cm^3, then the volume (in cm^3) of the cone is:

- A. 891
- B. 889
- C. 882 ✓
- D. 885

Q17 Cone-cylinder volume ratio

The ratio of the heights of a right circular cone and a right circular cylinder is 6 : 5 and the ratio of the radii of their bases is 4 : 3. If the volume of the cylinder is 630 cm^3, then the volume (in cm^3) of the cone is:

- A. 441
- B. 444
- C. 448 ✓
- D. 449

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Q18 Conical tent

A conical tent was erected by Army at a base camp to accommodate people. The height of the tent is 42 m and the area of the base camp is 200 m^2. If each person requires 70 m^3 of air to breathe, how many persons can be accommodated in that tent?
(Use π = 22/7)

A. 50
B. 60
C. 40 ✓
D. 45

Q19 Cubes in cuboid

A large cuboid-shaped container has the following dimensions: length = 15 meters, width = 8 meters, and height = 6 meters. A cube-shaped object with an edge length of 4 meters is placed inside the container. How many such cubes can be placed inside the container without any part sticking out?

A. 8
B. 10
C. 6 ✓
D. 12

Q20 Cubes into cuboid

Three identical cubes, each with edge 8 cm, are placed adjacent to each other to form a cuboid. What is the percentage decrease in the total surface area compared to the sum of surface areas of the three separate cubes? (Rounded off to two decimal places.)

A. 27.53%
B. 22.22% ✓
C. 20.24%
D. 25.67%

Q21 Room volume

In a room with dimensions 20m × 15m × 12m has a rectangular window of dimension 1m × 2m through which fresh air flows into the room. What should be the airflow rate (in m/min) through the window per unit area so that one-fourth of the air in the room would change every hour?

A. 7.5 ✓
B. 4
C. 2.5
D. 9

Q22 3D mensuration

The circumference of the base of a solid right circular cylinder is 88 cm and its height is 153 cm. What is the volume (in cm^3) of the cylinder?

$$Take\ \pi = \frac{22}{7}$$

A. 93,794
B. 94,248 ✓
C. 95,071
D. 94,453

Q23 3D mensuration

Three cubes of sides 1 cm, 6 cm and 8 cm are melted to form a new cube. Find $(\frac{2}{3})rd$ of the surface area of the new cube.

A. 486 cm2
B. 648 cm2
C. 162 cm2
D. 324 cm2 ✓

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Q24 3D mensuration

A solid metallic sphere of radius 12 cm is melted and recast into smaller spherical balls of 2 cm radius each. What will be the total surface area of all the spherical balls so obtained?

A. 3456π sq. cm ✓

B. 864π sq. cm

C. 216π sq. cm

D. 2304π sq. cm

Q25 3D mensuration

A hemispherical dome of radius 14 m is to be painted both inside and outside. If the cost of painting is ₹45 per m^2 and a platform costing ₹1,200 is needed for the work, find the total cost. $(\text{Use } \pi = \frac{22}{7})$

A. ₹1,10,200

B. ₹1,12,080 ✓

C. ₹1,14,500

D. ₹1,08,500

Q26 3D mensuration

The volume of a cylinder having height 49 cm and radius 17 cm is _____.

$Use\ \pi = \frac{22}{7}$

A. 44506 cm3 ✓

B. 44492 cm3

C. 44580 cm3

D. 44426 cm3

Q27 3D mensuration

The volume (in cm^3) of a rod of diameter 10 cm and length 35 m is:

$\left(\text{Take } \pi = \frac{22}{7}\right)$

A. 2,75,900

B. 2,74,400

C. 2,75,200

D. 2,75,000 ✓

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Q28 3D volume

$\pi = \frac{22}{7}$

A. $785\frac{5}{7}\text{cm}^3$ ✓

B. $785\frac{6}{7}\text{cm}^3$

C. $685\frac{5}{7}\text{cm}^3$

D. $685\frac{6}{7}\text{cm}^3$

Q29 Cylinder surface area

The curved surface area and the total surface area of a cylinder are in the ratio 1:16. If the total surface area of the right cylinder is 6028.8 cm^2, then its volume (in cm^3) is:

(Take $\pi = 3.14$)

A. 5656

B. 5648

C. 5624

D. 5652 ✓

Q30 Hemisphere capacity

Sonali has a hemispherical pot having a radius of 21 cm. How much water (in litres) can be filled in it?

(Use $\pi = \frac{22}{7}$)

A. 38.808

B. 28.702

C. 9.702

D. 19.404 ✓

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Data Interpretation 3 Questions • Answer Key

Q1 Table DI

The following table shows the price (in ₹ per 100 kg) of different items during different years. Answer the given question based on this table. What is the average price (in ₹ per 10 kg) of pulses from the years 1990 to 2010?

	1990	1995	2000	2005	2010
Rice	800	1150	1680	2400	3500
Wheat	450	700	1200	1650	2100
Pulses	2000	2700	3650	4600	6400
Sugar	1500	2200	3000	3800	4500
Groundnut	1200	1700	2450	3500	4200
Oil	4200	5500	6400	800	11000

A. 404

B. 387 ✓

C. 394

D. 414

Q2 Table DI

Study the given table carefully and answer the questions that follow. The given table indicates the production of different types of cars (in thousands) from 1998 to 2003.

Year Types	1998	1999	2000	2001	2002	2003
A	36	34	40	35	43	45
B	20	22	25	23	20	16
C	14	30	16	25	30	35
D	60	40	45	55	60	60
E	40	44	48	50	80	100

In which year is the total production of A and D together equal to the total production of C and E together?

A. 1998

B. 2000

C. 1999 ✓

D. 2001

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Q3 Table DI

The following table gives the total number of employees and the percentage of males and females working in 5 different companies A, B, C, D and E. Study the graph and answer the question.

Company	Total no. of employees	Percentage of males	Percentage of females
A	900	60%	40%
B	600	55%	45%
C	500	75%	25%
D	800	65%	35%
E	700	70%	30%

The total number of females in companies B, C and D is what percentage of the total number of males in companies A and E (up to 2 decimal places)?

A. 65.53% ✓

B. 55.63%

C. 66.43%

D. 60.33%

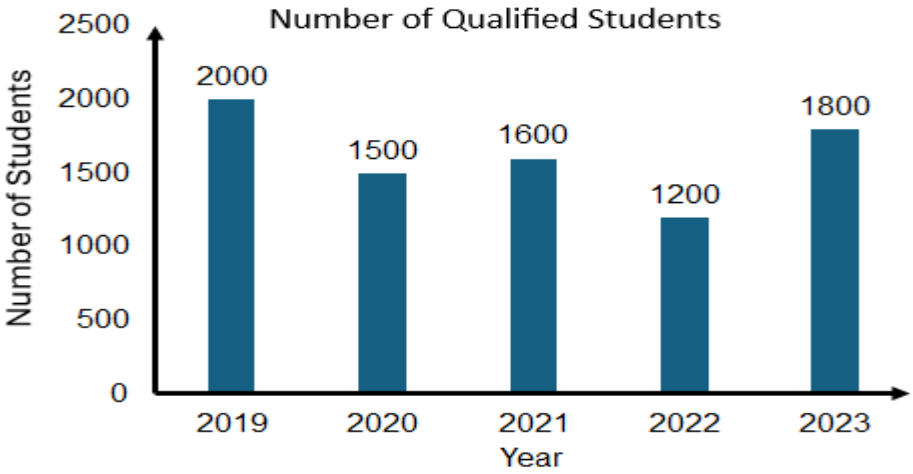
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Data Interpretation 1 Question • Answer Key

Q1 Bar graph

The following bar graph shows the number of students who qualified in a competitive examination from 2019 to 2023. Study the bar graph and answer the question that follows.



In which two consecutive years was the percentage increase in the number of qualified students the highest?

A. 2020 - 2021

B. 2022 - 2023 ✓

C. 2019 - 2020

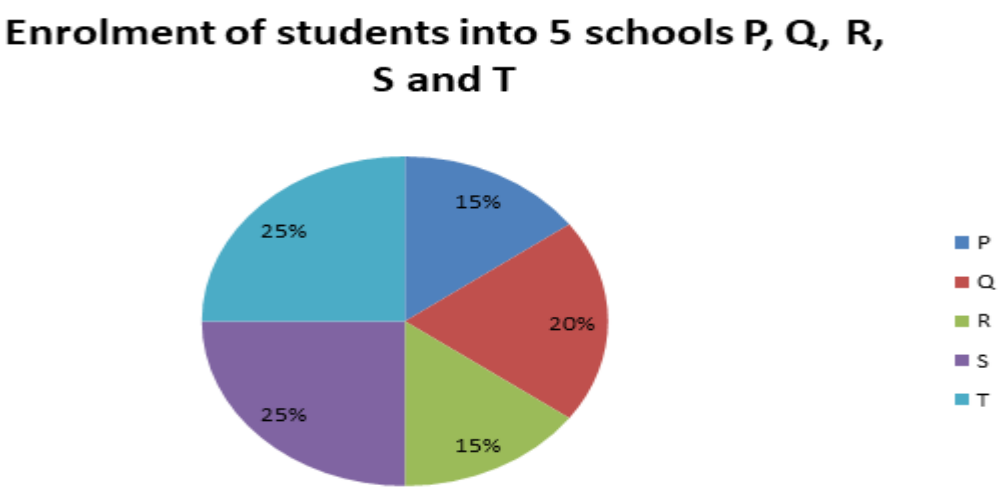
D. 2021 - 2022

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Q1 Pie chart

The following pie chart shows the enrolment of students into tenth class in 5 different schools: P, Q, R, S and T. The total number of students enrolled is 2,000. Study the chart and answer the question that follows.



Find the total number of students enrolled in schools P, R and S.

A. 1,200

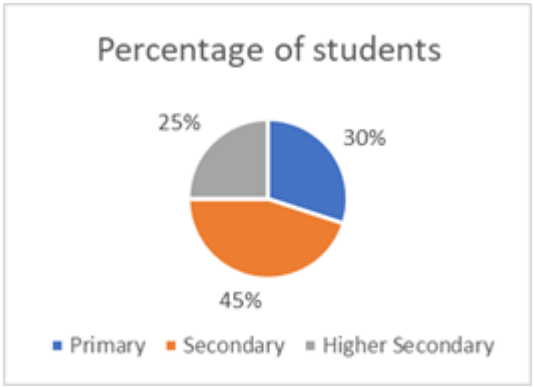
B. 1,000

C. 1,100 ✓

D. 1,400

Q2 Pie chart

The pie-chart shows percentage of students availing scholarship in a school. If the total strength of the school is 3850 and the ratio of students in primary section to secondary section to higher secondary section is 5 : 4 : 2, find the number of secondary students who availed the scholarship.



A. 742

B. 788

C. 670

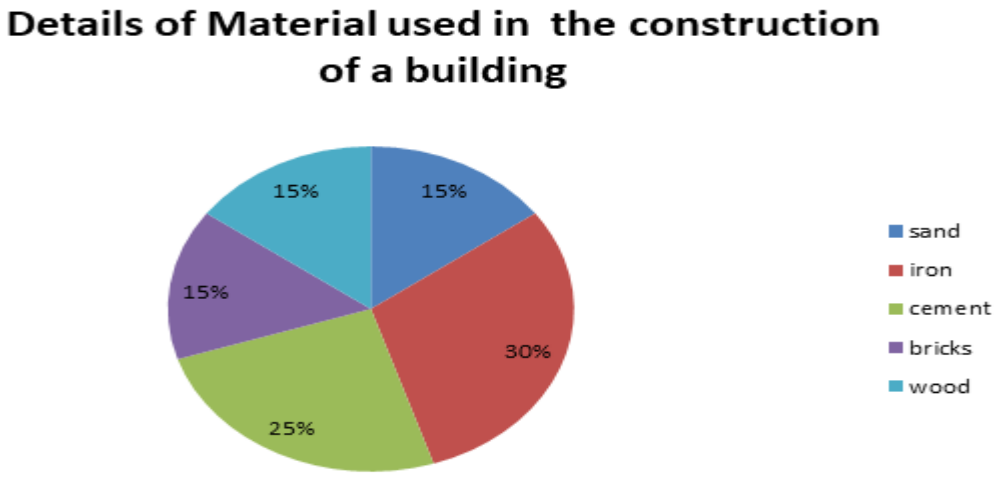
D. 630 ✓

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Q3 Pie chart

The following pie chart shows the details of material used in the construction of a building. The total cost of construction is ₹25,00,000. Study the chart and answer the question that follows.



Calculate the expenditure on iron, bricks and cement used in the construction of the building.

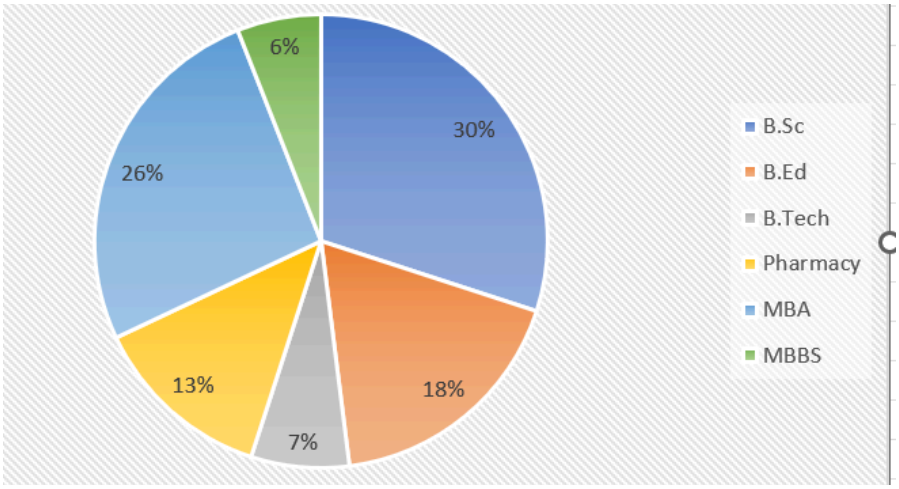
A. ₹15,50,000

B. ₹17,50,000 ✓

C. ₹14,50,000

D. ₹12,50,000

Q4 Pie chart



A. 715

B. 765

C. 650 ✓

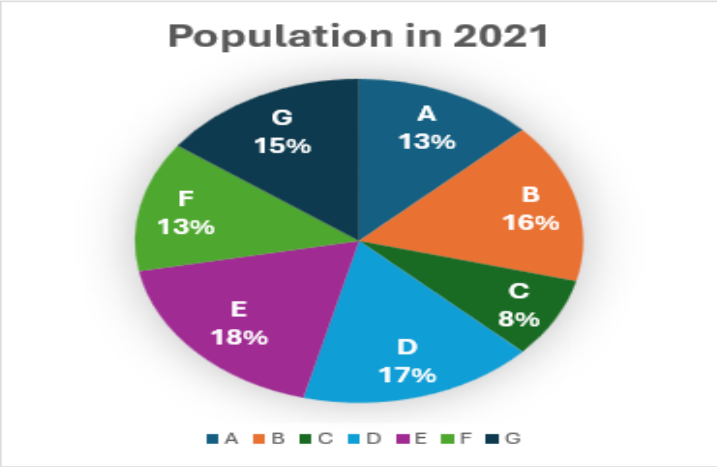
D. 635

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Q5 Pie chart

Study the pie chart to answer the question that follow. The population proportion of seven towns in 2021 is shown in the pie chart.



If the total population of all the towns is 3,07,500 and 40% of the population of the town G is under poverty line. The number of people under poverty line of town G is:

A. 18,540

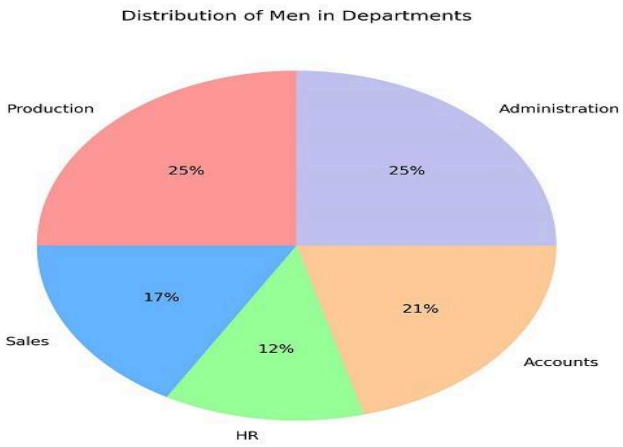
B. 19,450

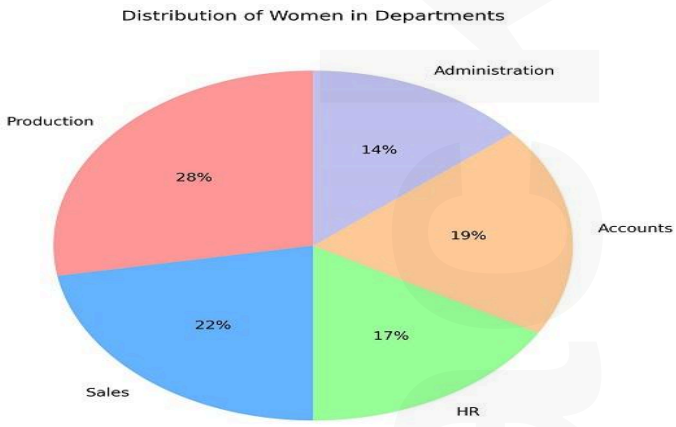
C. 18,450 ✓

D. 19,540

Q6 Pie chart

The pie charts given below illustrate the distribution of male and female employees across various departments in a company.





If there are 600 men and 900 women in the company, find the total number of workers in the Production department.

A. 450

B. 500

C. 402 ✓

D. 350

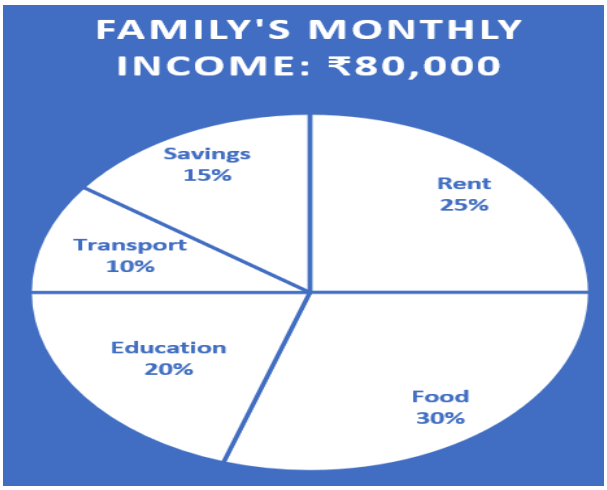
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Q7 Pie chart

Study the pie chart and answer the question that follows.

The given pie chart shows the monthly expenses of a family, whose income is ₹80,000.



If the family's income increases by 25% next month and they maintain the same percentage distribution, what will be the new amount spent on 'Rent'?

A. ₹30,000

B. ₹27,500

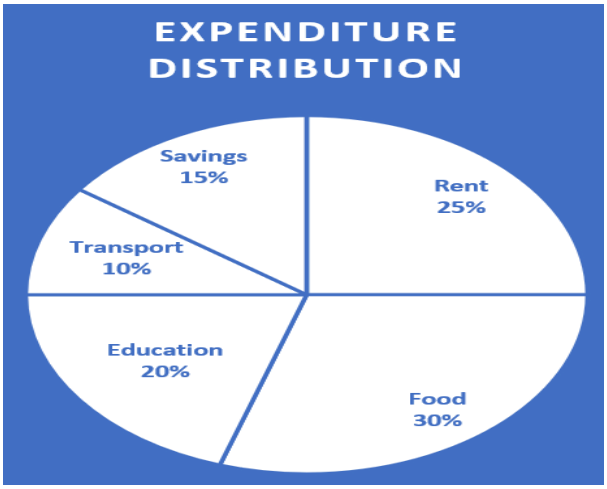
C. ₹25,000 ✓

D. ₹22,500

Q8 Pie chart

Study the pie chart and answer the question that follows.

The given pie chart shows the expenditure distribution of a family's monthly income of ₹80,000.



How much does the family spend on 'Education'?

A. ₹20,000

B. ₹14,000

C. ₹16,000 ✓

D. ₹18,000

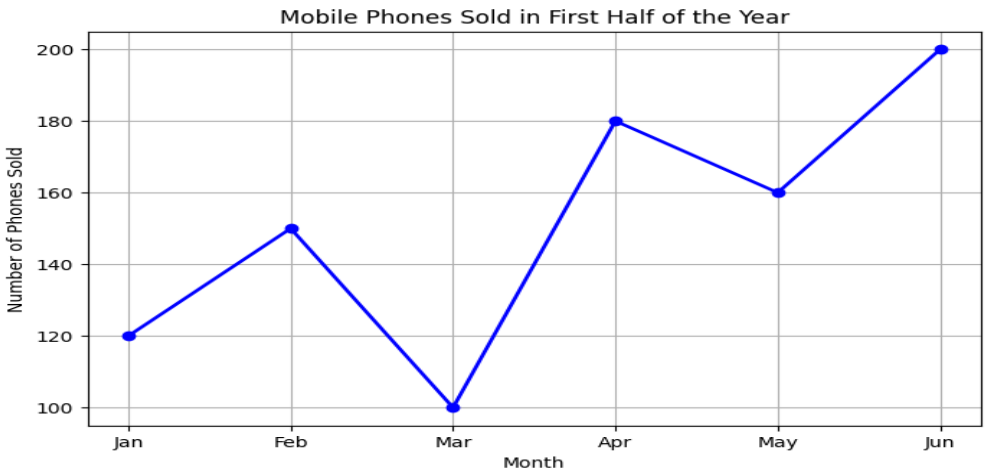
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Q1 Line graph

Study the line graph and answer the question that follows.

The given line graph shows the number of mobile phones sold by a store during the first six months of a year.



(Note: Number of phones sold in February were 150.)

Find the average monthly sales of phones. (Round off your answer to the nearest integer.)

A. 150

B. 174

C. 152 ✓

D. 162

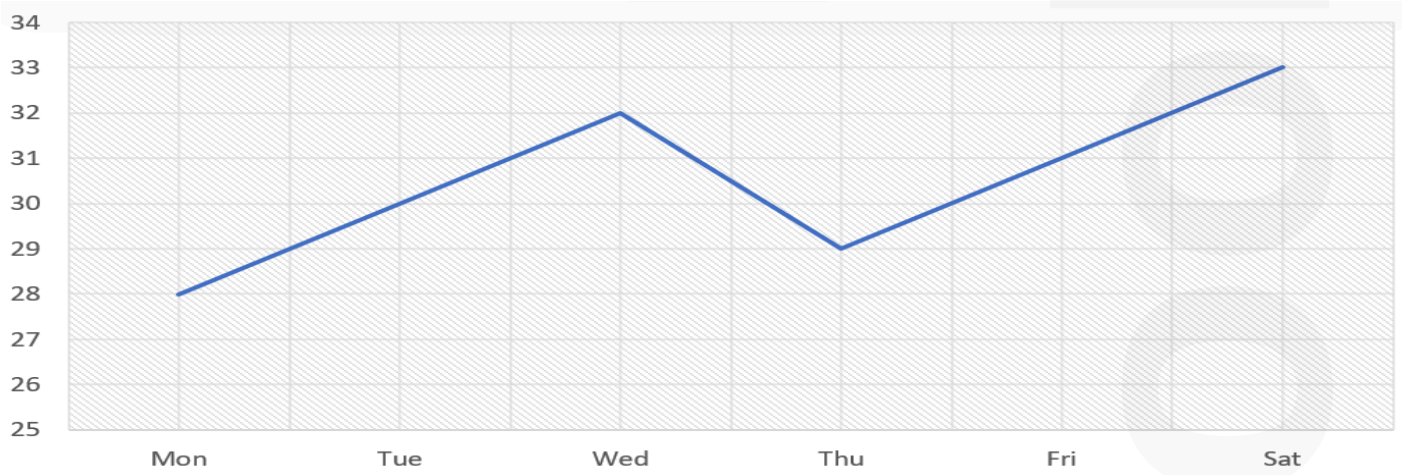
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Q2 Line graph

Study the line graph and answer the question that follows.

The given line graph shows the temperature in °C in a city over six days.



What is the difference between the maximum and minimum temperatures recorded?

A. 7°C

B. 5°C ✓

C. 6°C

D. 4°C

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Number System

2 Questions • Answer Key

Q1 Prime numbers

Find the sum of all prime numbers greater than 2 but less than 30.

A. 136

B. 129

C. 178

D. 127 ✓

Q2 Sum of squares

Find the value of the following expression.

$5^2 + 10^2 + 15^2 + \cdots + 50^2$

A. 8625

B. 9525

C. 9625 ✓

D. 10525

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Q1 Divisibility / HCF-LCM

The 7-digit number 98A038B is divisible by 3. What is the maximum value of (A + B)?

- A. 12
- B. 16
- C. 17 ✓
- D. 18

Q2 Divisibility / HCF-LCM

The 7-digit number 71A510B is divisible by 3. What is the maximum value of (A + B)?

- A. 11
- B. 13
- C. 16 ✓
- D. 12

Q3 Divisibility / HCF-LCM

The H.C.F. and the L.C.M. of two numbers are 13 and 585, respectively. If one of the numbers is 117, then find the other number.

- A. 65 ✓
- B. 78
- C. 13
- D. 52

Q4 Divisibility / HCF-LCM

The 7-digit number 34A690B is divisible by 3. What is the maximum value of (A + B)?

- A. 14
- B. 16
- C. 18
- D. 17 ✓

Q5 Divisibility / HCF-LCM

The 7-digit number 23A908B is divisible by 3. What is the maximum value of (A + B)?

- A. 13
- B. 17 ✓
- C. 14
- D. 16

Q6 Divisibility / HCF-LCM

The H.C.F. and the L.C.M. of two numbers are 18 and 540, respectively. If one of the numbers is 90, then find the other number.

- A. 108 ✓
- B. 126
- C. 72
- D. 144

Q7 Divisibility / HCF-LCM

The H.C.F. and the L.C.M. of two numbers are 34 and 408, respectively. If one of the numbers is 102, then find the other number.

- A. 64
- B. 122
- C. 121
- D. 136 ✓

Q8 Divisibility / HCF-LCM

The 7-digit number 82A337B is divisible by 3. What is the maximum value of (A + B)?

- A. 17
- B. 16 ✓
- C. 11
- D. 18

Q9 Divisibility / HCF-LCM

The sum of the digits of the greatest number that will divide 1359, 1871 and 2767 leaving the same remainder 15 in each case is:

- A. 10 ✓
- B. 8
- C. 9
- D. 12

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Q10 HCF-LCM

Three numbers are in the ratio 1:2:3. If their LCM is 198, find their HCF.

A. 9

B. 11

C. 33 ✓

D. 18

Q11 LCM with remainder

The least number which when increased by 7 is divisible by each of the numbers 32, 36, 54 and 64 is:

A. 1632

B. 1721 ✓

C. 1245

D. 1439

Q12 Sum and LCM

The sum of two numbers is 64 and their L.C.M. is 220. The two numbers are:

A. 42, 22

B. 37, 27

C. 49, 15

D. 44, 20 ✓

Q13 Divisibility / HCF-LCM

The HCF of two numbers is 12, and their product is 31,104. How many such pairs of numbers are possible?

A. 1

B. 5

C. 2 ✓

D. 4

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Number System

8 Questions • Answer Key

Q1 AP

An arithmetic progression has 42 as its first term, 60 as its last term, and a total of 14 terms. What is the sum of these 14 terms?

A. 711
B. 714 ✓
C. 717
D. 716

Q2 AP

An arithmetic progression has 42 as its first term and 55 as its last term, with a total of 10 terms. What is the sum of these 10 terms?

A. 484
B. 485 ✓
C. 487
D. 488

Q3 AP

In an A.P., the common difference is -7 and the first term is 31. Find the 10th term.

A. -33
B. -32 ✓
C. -30
D. -29

Q4 AP

The 11th term of the A.P. whose first and second terms are 32 and 9 , is:

A. -201
B. -195
C. -197
D. -198 ✓

Q5 AP

An arithmetic progression has 32 as its first term and 48 as its last term, with a total of 12 terms. What is the sum of these 12 terms?

A. 482
B. 478
C. 480 ✓
D. 479

Q6 AP

An arithmetic progression has 54 as its first term and 72 as its last term, with a total of 10 terms. What is the sum of these 10 terms?

A. 627
B. 632
C. 631
D. 630 ✓

Q7 AP

In an A.P., the common difference is -9 and the first term is 50. Find the 3rd term.

A. 31
B. 34
C. 32 ✓
D. 30

Q8 AP

The 30th term of the A.P. whose first and second terms are -2 and 13 , is:

A. 435
B. 436
C. 433 ✓
D. 434

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Q1 Central tendency

The mode and median of a data are 13.8 and 64, respectively. What is the mean of the data? (Use empirical formula.)

A. 92.1

B. 89.1 ✓

C. 80.4

D. 93.3

Q2 Central tendency

Find the mode (in ₹) for the following set of data of income of 40 people (rounded off to nearest integer).

Income (in ₹): 1000-1200 1200-1400 1400-1600 1600-1800 1800-2000
Number of people: 5 8 15 7 5

A. 1493 ✓

B. 1522

C. 1535

D. 1456

Q3 Central tendency

The marks scored by 10 students are given below.

16, 13, 20, 18, 16, 14, 18, 11, 10, 16

The mode of the data is:

A. 20

B. 18

C. 13

D. 16 ✓

Q4 Central tendency

The median of the following data is 350.

Class Interval	Frequency
0 - 100	4
100 - 200	6
200 - 300	x
300 - 400	10
400 - 500	y
500 - 600	8

What are the values of x and y if the total frequency is 40?

A. x = 8, y = 4

B. x = 6, y = 6

C. x = 5, y = 7 ✓

D. x = 3, y = 9

Q5 Central tendency

The mean and mode of a data set are 52 and 55, respectively. Find the median of the data set.

A. 50

B. 51

C. 48

D. 53 ✓

Q6 Central tendency

The following frequency distribution represents the monthly electricity consumption of 60 consumers in a locality.

Monthly Consumption (in units)	Number of consumers
50 - 65	5
65 - 80	8
80 - 95	12
95 - 110	18
110 - 125	10
125 - 140	7

What is the median of the data (correct to 2 decimal places)?

A. 73.27

B. 81.19

C. 85.13

D. 99.17 ✓

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Q7 Central tendency

A data set consists of six test scores: 18, 22, 24, 28, 30, and 35. Find the median of this data set.

- A. 32
- B. 24
- C. 28
- D. 26 ✓

Q8 Central tendency

The length (in mm) of the shoes of few students were measured and observations are as under. Find the median length of the shoes (in mm).

Length: 123 124 122 120 121 125
Number of students: 6 8 10 12 15 9

- A. 121
- B. 124
- C. 123
- D. 122 ✓

Q9 Central tendency

The mode of the following data is 8. Find the value of f.

Class Intervals	frequency
0 - 6	13
6 – 12	f
12 – 18	7
18 – 24	10
24 - 30	8

- A. 21
- B. 16
- C. 15
- D. 19 ✓

Q10 Central tendency

If a data set has a median of 92 and a mean of 84, what is the value of the mode?

- A. 98
- B. 96
- C. 108 ✓
- D. 102

Q11 Central tendency

Find the median of all the odd numbers between 520 and 550.

- A. 537
- B. 531
- C. 533
- D. 535 ✓

Q12 Central tendency

Find the mode for the following data representing weekly wages (₹) of workers.

Wage Range (₹)	Frequency
200-250	6
250-300	12
300-350	20
350-400	25
400-450	10
450-500	7

- A. 362.5 ✓
- B. 364
- C. 360.5
- D. 361

Q13 Central tendency

The marks of 9 students are:

18, 22, 25, 28, 30, 35, 38, 40, 45.

If the marks of the students who scored 45 are replaced by 50, find the new median.

- A. 30 ✓
- B. 25
- C. 29
- D. 28

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Q14 Central tendency

The mean of 50 scores is 87. It is later observed that two scores 52 and 37 were INCORRECTLY entered as 25 and 39, respectively. What is the correct mean of the 50 scores?

A. 87.5 ✓

B. 87

C. 99.5

D. 88

Q15 Central tendency

Median of the data 8, 4, 2, 1, 5, 3, 2, 1, 4, 2, 8, 1, 2, 9, 0, 4, 5, 4, 6, 7, 11, 3, 13, −1 is _____.

A. 3

B. 3.5

C. 4.5

D. 4 ✓

Q16 Central tendency

The median of the data given below is _____, approximately.

Class	Frequency
0-25	6
25-50	4
50-75	9
75-100	5

A. 54.44

B. 55.55 ✓

C. 57.77

D. 56.66

Q17 Grouped data median

For the frequency distribution of weights of sorghum ear-heads given in table below. Find the median.

Weights of ear heads (in g)	No of year head (f)	Cumulative frequency (f)
60-80	22	22
80-100	38	60
100-120	45	105
120-140	35	140
140-160	24	164
Total	164	

(Round off your answer to two decimal places)

A. 109.24 g

B. 109.78 g ✓

C. 1108.26 g

D. 108.54 g

Q18 Central tendency

The following data pertaining to the number of insects per plant. Find median number of insects per plant.

Number of insects per plant (x)	1	2	3	4	5	6	7	8	9	10	11	12
No. of plants (f)	1	3	5	6	10	13	9	5	3	2	2	1

A. 9

B. 8

C. 6 ✓

D. 5

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Q19 Central tendency

Find mode for the following distribution.

Class interval	Frequency
0-80	8
8-16	7
16-24	16
24-32	24
32-40	15
40-48	7

(Round off your answer to two decimal places)

A. 24.86

B. 29.16

C. 23.56

D. 27.76 ✓

Q20 Central tendency

The mode of the following data is 3.5. Find the value of x.

Class Intervals	0-1	1-2	2-3	3-4	4-5
Frequency	1	3	x	7	4

A. 4 ✓

B. 5

C. 3

D. 6

Q21 Grouped data

The following data gives the information on the observed lifetime (in hours) of 225 electronic components.

Lifetime (in hours)	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of electronic components	11	36	52	61	37	28

What is the modal lifetime (in hours, rounded to 2 decimal places) of the components?

A. 33.72

B. 37.32

C. 32.73 ✓

D. 32.33

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Q22 Grouped data

The following table shows the wages (in ₹) of a group of workers.

Wages (in ₹)	20-30	30-40	40-50	50-60	60-70
Number of Workers	25	12	15	13	5

Find the median wage. (Round your answer to the nearest paise.)

A. 38.33 ✓

B. 36.75

C. 34.25

D. 39.25

Q23 Grouped data mean

f_i

A. 3.12

B. 2.42

C. 3.32 ✓

D. 2.46

Q24 Grouped data mode

The given table shows the distribution of weekly wages (₹) of workers. Find the mode.

Wages (₹)	100–150	150–200	200–250	250–300	300–350
Frequency	6	12	15	24	15

A. 270

B. 260

C. 275 ✓

D. 265

Q25 Grouped data mode

If the mode of a grouped data is 45.2, lower limit of modal class is 40, class width is 10, $f_1 = 25$, $f_0 = 18$, what is the value of f_2? (Rounded off to the nearest whole number)

A. 16

B. 18

C. 19 ✓

D. 20

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Q1 Dispersion

Find an estimate of the variance of the following data (rounded off to two decimal places).

Class: 0-10 10-20 20-30 30-40 40-50
Frequency: 8 16 24 25 17

A. 185.05
B. 190.34
C. 147.67 ✓
D. 163.11

Q2 Dispersion

Consider the data set: 4, 8, 6, 5, 3, 9. Find the standard deviation (correct up to two decimal places).

A. 1.83
B. 2.31
C. 2.11 ✓
D. 1.76

Q3 Dispersion

The sum of 100 observations and the sum of their squares are 400 and 2475, respectively. Later on, three observations, 3,4 and 5, were found to be incorrect. If the incorrect observations are omitted, then the variance of the remaining observations is:

A. 9 ✓
B. 8.05
C. 8.65
D. 8.25

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Statistics

9 Questions • Answer Key

Q1 Class mark

Find the class interval corresponding to the class mark x_i = 27, where the lower limit of the first continuous class interval is 7.

x_i	f_i
11	3
19	7
27	11
35	5
43	3

A. 21 – 33

B. 22 – 32

C. 23 – 31 ✓

D. 24 – 30

Q2 Probability

The probability of an event A occurring is 0.6 and that of B occurring is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B occurring is:

A. 0.9

B. 0.2

C. 0.45

D. 0.1 ✓

Q3 Probability

Box A contains 5 red and 4 white marbles and box B contains 3 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of the same colour?

A. $\frac{19}{27}$

B. $\frac{17}{27}$

C. $\frac{13}{27}$ ✓

D. $\frac{11}{27}$

Q4 Probability

Two fair cubical dice, with the faces numbered from 1 to 6 in each of the dice, are rolled. What is the probability that the sum of the numbers on the two faces that appear on top is 8, given that each of the two faces that appear on top shows an odd number?

A. $\frac{5}{36}$

B. $\frac{2}{9}$ ✓

C. $\frac{1}{18}$

D. $\frac{2}{5}$

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Q5 Probability

Five car accidents occurred in a week. What is the probability that they all occurred on the same day?

A. $\frac{1}{5^7}$

B. $\frac{1}{5^4}$

C. $\frac{1}{7^5}$

D. $\frac{1}{7^4}$ ✓

Q6 Probability

Two fair six-sided dice which have numbers from 1 to 6 on their faces are rolled. What is the probability that the sum of the numbers rolled is greater than 8?

A. $\frac{5}{18}$ ✓

B. $\frac{4}{9}$

C. $\frac{1}{3}$

D. $\frac{1}{5}$

Q7 Probability

Two dice are thrown simultaneously. The probability that the sum of the numbers on the faces turned up exceeds 7 is:

A. $\frac{5}{12}$ ✓

B. $\frac{13}{36}$

C. $\frac{11}{36}$

D. $\frac{7}{12}$

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Q8 Probability

Find the probability that a randomly chosen number from the first 80 natural numbers is either a perfect square or divisible by 7.

A. $\frac{9}{40}$ ✓

B. $\frac{5}{42}$

C. $\frac{9}{37}$

D. $\frac{7}{40}$

Q9 Probability

Suppose that an unbiased pair of dice is rolled. Let A denote the event that the same number shows on each die. Let B denote the event that the sum is greater than 7. Find P(A\B) and P(B\A), respectively.

A. $\frac{1}{6}, \frac{1}{5}$

B. $\frac{1}{5}, \frac{1}{2}$ ✓

C. $\frac{1}{5}, \frac{1}{12}$

D. $\frac{1}{6}, \frac{1}{12}$

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