RRB Technician Grade III 2025

Technician Grade III · CEN 02/2025 · Mathematics · Question Paper Compilation

Marathi

All 5 Shifts (Sets) · Mathematics Section · Official Answer Key

About this Compilation

This booklet compiles all **5 shift papers** of the **RRB Technician Grade III 2025** examination (CEN 02/2025) in **Marathi** (**Mathematics** section only), with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear in shift order, numbered 1 onward within each set.
- Diagram and wide-table questions appear at full width at the end of their set.
- The correct answer is highlighted in green with a tick.

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Index — All Sets (click to open)

Mathematics

25 Questions • Answer Key

Q1 Mathematics

If 15 workers can build a wall in 10 days, how many workers are needed to build it in 6 days?

A. 20
B. 26
C. 25 ✓
D. 22

Q2 Mathematics

Find the product of the common prime factors of the numbers 1950, 1560 and 2340.

A. 480
B. 390 ✓
C. 360
D. 520

Q3 Mathematics

The sum of the present ages of Sharad and Adarsh is 36 years. After 2 years from now, Sharad's age will be three times that of Adarsh. Sharad's present age (in years) is:

A. 24
B. 26
C. 28 ✓
D. 37

Q4 Mathematics

A can finish a work in 5 days and B can do the same work in 50 days. B worked alone for 10 days and left the job. In how many days can A alone finish the remaining work?

A. 4 ✓
B. 3.5
C. 3
D. 4.5

Q5 Mathematics

The value of a machine is first depreciated by 20%. It is then appreciated by 25% and finally depreciated by 10%. Find the overall percentage change in its value.

A. 12%नी घट
B. 8%नी घट
C. 5%नी घट
D. 10%नी घट ✓

Q6 Mathematics

For a given data, the mean is 48.5 and the median is 44. The mode of the data is:

A. 42
B. 32
C. 35 ✓
D. 25

Q7 Mathematics

If the lateral surface area of a cylinder is 140.1 cm^2 and its height is 3 cm, then find its volume. (Use π = 3.14 and round off to two decimal places.)

A. 570.58 cm3
B. 562.32 cm3
C. 559.99 cm3
D. 520.91 cm3 ✓

Q8 Mathematics

Two trains of lengths 120 m and 180 m are running in opposite directions at speeds of 60 km/h and 75 km/h, respectively. In how many seconds will they completely cross each other?

A. 10 सेकंद
B. 9 सेकंद
C. 11 सेकंद
D. 8 सेकंद ✓

Q9 Mathematics

During a sale 50% of the goods are sold at 40% profit, 40% of the remaining goods are sold at 13% profit and the still remaining goods are sold at a loss of 32%. If there is an overall profit of x%, then what is the value of x?

A. 12.5
B. 14
C. 13.5
D. 13 ✓

Q10 Mathematics

A shopkeeper lists the price of a fan at 36% above its cost price and offers a 25% discount on its list price. If he earns a profit of ₹179, then what is the list price (in ₹) of the fan?

A. 12,166
B. 12,213
C. 12,247
D. 12,172 ✓

Q11 Mathematics

The average of three numbers is 20. If the two numbers are 11 and 22, respectively, then the third number is:

A. 29
B. 26
C. 27 ✓
D. 28

Q12 Mathematics

If a sum of ₹8000 becomes thrice of itself after 8 years on compound interest, then how much will it become after 24 years?

A. ₹206000
B. ₹216000 ✓
C. ₹236000
D. ₹253000

Q13 Mathematics

The length of one of the two parallel sides of a trapezium is 8 cm, while the length of the other side of this pair of parallel sides is equal to the distance between this pair of parallel sides. If the area of the trapezium is 120 cm^2, then what is the distance (in cm) between the said pair of parallel sides?

A. 10
B. 15
C. 20
D. 12 ✓

Q14 Mathematics

If the surface area of a sphere is 314 cm^2, find its radius.
(Take π = 3.14)

A. 5 cm ✓
B. 0.05 cm
C. 50 cm
D. 0.5 cm

Q15 Mathematics

When one-third of a number is increased by 87, the result is 107. Find the sum of the digits of the original number.

A. 3
B. 5
C. 8
D. 6 ✓

Q16 Mathematics

A, B, C, and D can do a piece of work in 12, 15, 20, and 30 days, respectively. All start together, but D leaves after 2 days, C leaves 3 days before the completion, and B leaves 2 days before the completion. Determine the total time required to complete the work.

A. 6 दिवस 2 तास ✓
B. 8 दिवस 6 तास
C. 5 दिवस 20 तास
D. 5 दिवस 10 तास

Q17 Mathematics

A classroom has 46 boys and 36 girls. If the number of girls is increased successively by 25% followed by another 20%, by how many will the number of girls exceed the number of boys?

A. 12

B. 6

C. 8 ✓

D. 10

Q18 Mathematics

A person borrows ₹10,000 for 3 years at 5% per annum simple interest. He immediately lends it to another person at $8\frac{1}{4}\%$ per annum simple interest for 3 years. What is his gain (in ₹) in the transaction per year?

A. 325 ✓

B. 375

C. 400

D. 450

Q19 Mathematics

$4 + \tan^2\theta + \cot^2\theta - \sec^2\theta \ \text{cosec}^2\theta$

A. 2 ✓

B. - 2

C. 4

D. 0

Q20 Mathematics

If a number is added to each of the numbers 16, 20 and 30, then the resulting numbers are in the continued proportion. Find the mean proportional between the largest and smallest of the resulting numbers.

A. $\frac{20}{3}$ ✓

B. $\frac{40}{3}$

C. $\frac{50}{9}$

D. $\frac{26}{9}$

Q21 Mathematics

Simplify:

$8 \times 8 + 6 \times 6 + [6 \times \{4 \div 2 \times (3 \text{ of } 2)\} - \{36 \div (6 \times 3) + (8 \times 3)\}] \div 2$

A. 73

B. 123 ✓

C. 93

D. 153

Q22 Mathematics

Simplify $(5z-12y)^2 + (12z+5y)^2 - 144z^2$.

A. $32z^2 + 170y^2$

B. $25z^2 + 169y^2$ ✓

C. $31z^2 + 161y^2$

D. $24z^2 + 171y^2$

Q23 Mathematics

Find the value of $36 - [10 - 3\{14 \div 2 - (10 \div 2 \times 3 - 4 + 7)\}]$.

A. -7 ✓

B. 5

C. -5

D. 7

Q24 Mathematics

If x is the third proportional to 2 and y, and y is the third proportional to x and 18, then what is the value of y?

A. $4\sqrt[3]{3}$

B. $3\sqrt[3]{3}$

C. $5\sqrt[3]{3}$

D. $6\sqrt[3]{3}$ ✓

Q25 Mathematics

What is the decimal form of $\frac{7}{2} + 32.5 + 1.245 + \frac{3}{4}$?

A. 39.778

B. 32.125

C. 37.995 ✓

D. 35.005

Mathematics

25 Questions • Answer Key

Q1 Mathematics

Two numbers are in the ratio of 4 : 5, and their HCF is 16. Find the LCM of the two numbers.

A. 340
B. 380
C. 320 ✓
D. 360

Q2 Mathematics

Fourteen years from now, the sum of A's and B's ages will be twice the sum of their current ages. If A is currently 8 years older than B, what is A's present age?

A. 12
B. 16
C. 10
D. 18 ✓

Q3 Mathematics

Three workers A, B, C can finish a job in 10, 15, and 20 hours respectively. A and B start; after 2 hours, C joins and they finish the remaining work in t more hours. What is the value of t? (Rounded off to the nearest integer.)

A. 5
B. 4
C. 6
D. 3 ✓

Q4 Mathematics

Anisha borrowed ₹28,260 from her friend at 9% per annum, simple interest. She returned the amount after 9 months. How much interest did she pay?

A. ₹ 1970.75
B. ₹ 1933.25
C. ₹ 1948.20
D. ₹ 1907.55 ✓

Q5 Mathematics

A cylindrical printing drum of length 2.1 m makes 350 complete revolutions and prints 4158 m^2 of fabric. What is the radius of the drum? (Take π = 22/7)

A. 60 cm
B. 80 cm
C. 70 cm
D. 90 cm ✓

Q6 Mathematics

One pipe can fill the tank in 20 min, while another pipe can empty the completely filled tank in 45 min. If both the pipes are operated together on empty tank, how long (in min) will it take to fill one-fourth of the tank?

A. 36
B. 27
C. 9 ✓
D. 18

Q7 Mathematics

If a book costs ₹300 and its price is increased by 5%, by how much the new price of the book after the increase is more than the original price?

A. ₹20
B. ₹15 ✓
C. ₹25.
D. ₹10

Q8 Mathematics

The lengths of two trains starting from stations P and Q are in the ratio 3 : 2. When they run in opposite directions at speeds of 54 km/h and 72 km/h, respectively, they cross each other in 30 seconds. The train starting from P crosses a bridge in 90 seconds. Find the length of the bridge.

A. 620 मीटर

B. 720 मीटर ✓

C. 740 मीटर

D. 780 मीटर

Q9 Mathematics

Anusha starts a business with ₹55,000 and after 7 months, Minal joins Anusha as her partner. After a year, the profit is divided in the ratio 8 : 3. What is Minal's contribution in the capital?

A. ₹49,410

B. ₹49,500 ✓

C. ₹48,745

D. ₹50,755

Q10 Mathematics

The average age of a husband and wife at the time of their marriage was 28 years. Their daughter was born two years after their marriage. If the present average age of all three family members is 24 years, how many years ago from now, did the couple get married?

A. 6 ✓

B. 7

C. 4

D. 8

Q11 Mathematics

A person X invests ₹12,000 for 12 months and person Y invests ₹18,000 but withdraws his investment after 6 months. If the total profit earned on their investment is ₹25,200, what is X's share in the profit?

A. ₹15,700

B. ₹14,400 ✓

C. ₹16,800

D. ₹ 13,900

Q12 Mathematics

A dealer buys two articles X and Y for ₹1,300 each. He marks each of them at the same price. He sells X by giving two successive discounts of 84% and 25% and still earns ₹734 as profit. If he sells Y at a single discount of 87%, then what is the profit percentage on Y?

A. 69%

B. 68%

C. 68.5%

D. 69.5% ✓

Q13 Mathematics

What sum of money (in ₹) will yield ₹720 as simple interest in 2 years at 5% per annum?

A. 7600

B. 6700

C. 7400

D. 7200 ✓

Q14 Mathematics

What is the mode of the following data?
51, 48, 50, 55, 44, 52, 45, 52, 44, 49, 55, 54, 44, 54, 43, 45, 55, 47

A. 54

B. 45

C. 55 ✓

D. 44

Q15 Mathematics

A student scored 84% of the maximum marks in an exam and passed by 62 marks. But when he scored 45% of the marks in the same exam, he failed by 35.5 marks. Find the maximum marks of the exam.

A. 225

B. 265

C. 250 ✓

D. 240

Q16 Mathematics

When one-third of a number is increased by 37, the result is 51. Find the sum of the digits of the original number.

A. 9

B. 8

C. 6 ✓

D. 3

Q17 Mathematics

A shopkeeper sold a book at a loss of 6%. If the selling price had been increased by ₹960, there would have been a gain of 19%. What was the cost price (in ₹) of the book?

A. 3845

B. 3850

C. 3835

D. 3840 ✓

Q18 Mathematics

The area of a square is 9 cm^2. Its perimeter is equal to the perimeter of a regular hexagon. What is the area (in cm^2) of the hexagon?

A. 32

B. $42\sqrt{3}$

C. 40

D. $6\sqrt{3}$ ✓

Q19 Mathematics

$10\cos^2\theta + 7\sin^2\theta = 70^\circ \leq \theta \leq 90^\circ (\sin\theta + \cos\theta)$

A. 1 ✓

B. 2

C. -1

D. 0

Q20 Mathematics

Which of the following numbers DOES NOT have exactly four distinct positive divisors?

A. p^2 for prime p ✓

B. p^3 for prime p

C. $p \cdot q$ for distinct primes p and q

D. q^3 for prime q

Q21 Mathematics

If $x = \frac{\sqrt{5} + 2}{\sqrt{5} - 2}$ and $y = \frac{\sqrt{5} - 2}{\sqrt{5} + 2}$, then find the value of $x^2 + y^2$.

A. 302

B. 311

C. 312

D. 322 ✓

Q22 Mathematics

If $x^2 + \frac{1}{x^2} = 16$ and $x \neq 0$, then what is the value of $x^4 + \frac{1}{x^4}$?

A. 254 ✓

B. 252

C. 260

D. 258

Q23 Mathematics

$\frac{1}{3}$

A. (i)

B. (iv)

C. (ii) ✓

D. (iii)

Q24 Mathematics

Simplify: $[(36 + 4 \times (3 + 2 \times (5 - 2))) \div (6 + 3)] + [(40 - (6 + 3 \times 2)) + (8 \times 2 - 6)]$

A. 52

B. 38

C. 46 ✓

D. 42

Q25 Mathematics

Simplify: $\left(\frac{5}{6}+\frac{1}{3}\right)\div\left(\frac{2}{5}+0.3\right)\times 0.5+\frac{5}{6}$

A. $\frac{5}{3}$ ✓

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

C. $\frac{5}{6}$

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

Mathematics

25 Questions • Answer Key

Q1 Mathematics

Find the sum of 8 exterior angles of a 24-sided regular polygon.

- A. 120° ✓
- B. 135°
- C. 140°
- D. 115°

Q2 Mathematics

Calculate the simple interest if the principal amount is ₹75,000, the rate is 5%, and the time is 5 years.

- A. ₹3750
- B. ₹16,870
- C. ₹18,750 ✓
- D. ₹7,850

Q3 Mathematics

A and B together can complete a task in 10 days, B and C in 12 days and A and C in 15 days. How long will A, B and C take to complete the task working together?

- A. 7 दिवस
- B. 10 दिवस
- C. 9 दिवस
- D. 8 दिवस ✓

Q4 Mathematics

A family's monthly income increased by 15%. They increased their monthly expenditure on food by 10% and on rent by 20%. If their initial monthly expenditure on food was ₹12,000 and on rent was ₹8,000, and their initial monthly savings were ₹15,000, what are their new monthly savings? (Assume that there is no other expenditure.)

- A. ₹25,000
- B. ₹15,000
- C. ₹17,450 ✓
- D. ₹18,650

Q5 Mathematics

The sum of 6 numbers is 240. Find their average.

- A. 41
- B. 38
- C. 40 ✓
- D. 39

Q6 Mathematics

Naveena's monthly income is ₹84,000. She spends 25% of his income on house rent, 20% on groceries, 15% on other household expenses, and saves the remaining amount. How much money (in ₹) does she save every month?

- A. 32,000
- B. 33,000
- C. 33,600 ✓
- D. 32,600

Q7 Mathematics

During a sale, 60% of the goods are sold at a profit of 21%. Of the remaining goods, 40% are sold at a profit of 46%, and the rest are sold at a loss of 29%. If the overall profit is x%, then what is the value of x?

- A. 13 ✓
- B. 3.5
- C. 9.5
- D. 3

Q8 Mathematics

If the lateral surface area of a cylinder is 775.8 cm^2 and its height is 24 cm, then find its volume. (Use π = 3.14 and round off to two decimal places.)

- A. 1962.74 cm3
- B. 1984.78 cm3
- C. 2016.67 cm3
- D. 1996.63 cm3 ✓

Q9 Mathematics

When one-third of a number is increased by 55, the result is 83. Find the sum of the digits of the original number.

- A. 12 ✓
- B. 13
- C. 14
- D. 9

Q10 Mathematics

What sum of money (in ₹) will yield ₹720 as simple interest in 2 years at 6% per annum?

- A. 6400
- B. 6200
- C. 5500
- D. 6000 ✓

Q11 Mathematics

A shopkeeper lists the price of a fan at 36% above its cost price and offers a 25% discount on its list price. If he earns a profit of ₹134, then what is the list price (in ₹) of the fan?

- A. 8,851
- B. 9,112 ✓
- C. 9,135
- D. 8,987

Q12 Mathematics

A 200 m long train passes a man standing on a platform in 10 seconds. How long will it take to cross another 350 m long train running at 60 km/h in the opposite direction?

- A. 15 सेकंद ✓
- B. 14 सेकंद
- C. 12 सेकंद
- D. 16 सेकंद

Q13 Mathematics

If the median and the mode are given as 65 and 60, respectively, find the mean.

- A. 62.5
- B. 70
- C. 68
- D. 67.5 ✓

Q14 Mathematics

A and B can complete a work in 12 days and 8 days, respectively. They started doing the work together but after 2 days, B had to leave, and A completed the remaining work alone. The whole work was completed in _____ days.

- A. 10
- B. 8
- C. 9 ✓
- D. 7

Q15 Mathematics

Find the fourth proportional to 3.5, 7.5, and 6.3.

- A. 12.5
- B. 11.5
- C. 14.5
- D. 13.5 ✓

Q16 Mathematics

If 6 machines produce 120 items in 8 hours, how many items can 9 machines produce in 4 hours at the same rate?

- A. 60
- B. 90 ✓
- C. 80
- D. 120

Q17 Mathematics

The sum of the present ages of Lokesh and Taresh is 24 years. After 2 years, Lokesh's age will be three times that of Taresh. Lokesh's present age (in years) is:

A. 22

B. 17

C. 19 ✓

D. 12

Q18 Mathematics

Six cubes each of side 4 cm, are placed adjacent to each other. Find the volume of the cuboid so formed.

A. 384 cm3 ✓

B. 512 cm3

C. 64 cm3

D. 256 cm3

Q19 Mathematics

Kirti starts a business with ₹27,000 and after 7 months, Vaishnavi joins Kirti as her partner. After a year, the profit is divided in the ratio 8 : 9. What is Vaishnavi's contribution in the capital?

A. ₹72,750

B. ₹72,875

C. ₹73,360

D. ₹72,900 ✓

Q20 Mathematics

The sum of the prime factors of 84 is:

A. 14

B. 12 ✓

C. 15

D. 18

Q21 Mathematics

Simplify: $\frac{\sqrt{16x^4-72x^2y^2+81y^4}}{\sqrt{4x^2-12xy+9y^2}}-(2x-3y)$, given that $2x>3y$.

A. $6y$ ✓

B. $4x$

C. $6y^2$

D. $4x^2$

Q22 Mathematics

Simplify: $\frac{[5 \text{ of } (2+4)]-\{6^2\div 3\}+2}{3 \text{ of } (5-2)\div 9}$

A. 20 ✓

B. 16

C. 22

D. 18

Q23 Mathematics

Simplify:

$[(120-24\div(4+2))\times 2-(50\div 5+6)]+[(18+12\times 2-8)-(9\div 3+5)]$

A. 242 ✓

B. 232

C. 252

D. 262

Q24 Mathematics

$\Delta\ PQR \angle Q = 90^{o} \tan R = \frac{1}{3}1+\frac{\sec P(3\cos R-\sin P)}{\operatorname{cosec} R\ (4\sin R-\cos P)}$

A. 5

B. 6

C. 3 ✓

D. 7

Q25 Mathematics

Simplify:

$\frac{2}{5}\ \text{of}\left(\left(\frac{3}{4}\div 0.25\right)+\frac{1}{2}\right)-\frac{1}{3}$

A. $\frac{16}{15}$ ✓

B. $\frac{17}{15}$

C. $\frac{14}{15}$

D. $\frac{13}{15}$

Mathematics

25 Questions • Answer Key

Q1 Mathematics

Two numbers are in the ratio of 4 : 9. If their sum is 26, then find the mean proportional between them.

A. 14
B. 10
C. 11
D. 12 ✓

Q2 Mathematics

How many positive integers less than 30 are co-prime to 30?

A. 5
B. 7
C. 8 ✓
D. 6

Q3 Mathematics

What sum of money (in ₹) will yield ₹740 as simple interest in 2 years at 5% per annum?

A. 7600
B. 6900
C. 7400 ✓
D. 7800

Q4 Mathematics

A car travels 120 km at an unknown speed x km/h and then returns at (x + 20) km/h. The average speed for the whole journey is 60 km/h. Find the value of x. (Round to one decimal place.)

A. 54.5
B. 51.6 ✓
C. 52.4
D. 50.2

Q5 Mathematics

A shopkeeper sold a book at a loss of 7%. If the selling price had been increased by ₹120, there would have been a gain of 17%. What was the cost price (in ₹) of the book?

A. 495
B. 505
C. 500 ✓
D. 510

Q6 Mathematics

The difference between the ages of Sakshi and Priya is 37 years. Five years ago from now, the sum of their ages was 95 years. If Sakshi is older than Priya, find Priya's present age (in years).

A. 24
B. 43
C. 34 ✓
D. 28

Q7 Mathematics

The value of $11^3 - 8^3$ is:

A. 806
B. 866
C. 819 ✓
D. 759

Q8 Mathematics

What is the mode of the following data?

40, 53, 47, 55, 42, 46, 50, 42, 54, 49, 40, 54, 43, 40, 44, 55, 49, 53

A. 49
B. 53
C. 55
D. 40 ✓

Q9 Mathematics

One pipe can fill the tank in 18 min, while another pipe can empty the completely filled tank in 72 min. If both the pipes are operated together on empty tank, how long (in min) will it take to fill two-third of the tank?

- A. 16 ✓
- B. 48
- C. 64
- D. 32

Q10 Mathematics

A dealer buys two articles X and Y for ₹1,200 each. He marks each of them at the same price. He sells X by giving two successive discounts of 80% and 44% and still earns ₹172 as profit. If he sells Y at a single discount of 88%, then what is the profit percentage on Y?

- A. 22%
- B. 21.5%
- C. 22.5% ✓
- D. 21%

Q11 Mathematics

A sum of money amounts to ₹52,020 in 6 months at the rate of 8% per annum when the interest is compounded quarterly. Find the sum.

- A. ₹51,000
- B. ₹48,000
- C. ₹49,000
- D. ₹50,000 ✓

Q12 Mathematics

Which of the following numbers is not divisible by both 94 and 68?

- A. 9588
- B. 3196
- C. 7990 ✓
- D. 6392

Q13 Mathematics

The mean of a data is 41 and its median is 98. The mode (using empirical relation) of the data is:

- A. 240
- B. 212 ✓
- C. 128
- D. 209

Q14 Mathematics

The difference between the ages of Anuja and Mahima is 42 years. Five years ago from now, the sum of their ages was 98 years. If Anuja is older than Mahima, find Mahima's present age (in years).

- A. 27
- B. 28
- C. 33 ✓
- D. 29

Q15 Mathematics

A person gave 40% of his income to his wife to look after household expenditure. He gave 20% of the remaining amount to each of his two sons and one daughter. One - third of the amount now left was spent on miscellaneous items and the remaining amount ₹14,400 was deposited in the bank. Find his income.

- A. ₹1,10,000
- B. ₹96,000
- C. ₹1,00,000
- D. ₹90,000 ✓

Q16 Mathematics

In a test, B got 50 marks while A got 80 marks out of 110 maximum marks. What percentage of A's marks were B's marks?

- A. 72.73 %
- B. 160 %
- C. 110 %
- D. 62.5 % ✓

Q17 Mathematics

Which of the following numbers is divisible by 11?

A. 502589

B. 502579 ✓

C. 512579

D. 513589

Q18 Mathematics

Karan and Arjun start a business. Karan invests ₹15,000 more than Arjun. Karan invests for 3 months, and Arjun invests for 4 months. At the end of the business, the total profit is ₹6,060, and Karan's share is ₹2,020 more than Arjun's share. Find the capital contributed by Karan.

A. ₹24,093

B. ₹23,885

C. ₹24,000 ✓

D. ₹24,087

Q19 Mathematics

Three inlet pipes A, B, and C can fill a tank in 8 hours, 12 hours, and 24 hours, respectively. First, pipe A is opened alone for 1 hour. Then pipe B is opened, and both A and B run together for the next 2 hours. After that, pipe C is also opened, and all three pipes run together until the tank is full. How much total time, from the start, will it take to fill the tank?

A. 4 तास 30 मिनिटे

B. 4 तास 40 मिनिटे

C. 4 तास 20 मिनिटे

D. 4 तास 50 मिनिटे ✓

Q20 Mathematics

If the length of the side of an equilateral triangle is 8 cm, find its area. (Use $\sqrt{3} = 1.732$).

$\sqrt{3} = 1.732$

A. 28.612 sq.cm.

B. 26.812 sq.cm.

C. 27.712 sq.cm. ✓

D. 24.812 sq.cm.

Q21 Mathematics

The sum of the length, breadth and height of a cuboid is p cm and its diagonal is q cm. Find its total surface area (in cm^2).

A. $(p-q)^2$

B. p^2+q^2

C. $\frac{p^2-q^2}{2}$

D. p^2-q^2 ✓

Q22 Mathematics

If $a = 0.1125$, then find the value of $100\left[\sqrt{1 + 2(3a) + 9a^2} - 4a\right]$.

A. 88.75 ✓

B. 87.75

C. 85.57

D. 87.57

Q23 Mathematics

Simplify: $\left(\frac{15}{24} \div \frac{15}{2}\right) \div \left(\frac{1}{8} \times \frac{16}{3} + \frac{1}{8}\right) + \frac{2}{11} \div \frac{19}{23} \text{ of } \frac{23}{11}$

A. $-\frac{4}{24}$

B. $\frac{4}{19}$ ✓

C. $-\frac{5}{23}$

D. $\frac{7}{18}$

Q24 Mathematics

$\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = 11\frac{25\tan^2\theta - 3}{36\cot^2\theta + 2} - 1\frac{11}{9}\frac{2}{9}\frac{2}{9}$

A. $\frac{11}{9}$

B. $\frac{2}{9}$ ✓

C. $\frac{7}{9}$

D. 1

Q25 Mathematics

The curved surface area of a right circular cylinder is 1056 cm² and its height is 16 cm. Find the total surface area of the cylinder.

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

A. 1974 cm2

B. 1749 cm2 ✓

C. 1479 cm2

D. 1794 cm2

Mathematics

25 Questions • Answer Key

Q1 Mathematics

A tap fills a tank in 11 hours. Another tap empties the full tank in 22 hours. How long (in hours) will it take to fill the tank completely, if the tank is empty and both the taps are open together?

- A. 25
- B. 23
- C. 24
- D. 22 ✓

Q2 Mathematics

What is the amount on ₹20,000 for six months at 12% annual interest, compounded quarterly?

- A. ₹21218 ✓
- B. ₹21335
- C. ₹21823
- D. ₹21934

Q3 Mathematics

A quantity is first decreased by 12% and then again decreased by 8%. What is the overall percentage decrease?

- A. 18.96%
- B. 20.96%
- C. 19.04% ✓
- D. 21.04%

Q4 Mathematics

A man sells two articles for ₹42000 each. He gets a profit of 45% on one article and loses 45% on the other article. What is his overall profit or loss (to the nearest integer) in this transaction?

- A. ₹21329 तोटा ✓
- B. ₹21329 नफा
- C. ₹21429 तोटा
- D. ₹21429 नफा

Q5 Mathematics

A traveller moves from City A to City B at 48 km/h and returns at 60 km/h. If the total time taken for the whole journey is 9 hours, find the distance between A and B.

- A. 260 km
- B. 270 km
- C. 250 km
- D. 240 km ✓

Q6 Mathematics

If 15 notebooks cost ₹240, then how many notebooks can be bought with ₹992?

- A. 62 ✓
- B. 66
- C. 64
- D. 60

Q7 Mathematics

In a college, class A has 25 students and class B has 30 students. If the number of students in class A increases by 20% in the first year and by 10% in the second year, and the number of students in class B increases by a total of 20% in two years, what is the overall percentage increase in the total number of students in the college over the two years? (Give your answer rounded off to 2 decimal places.)

- A. 25.85%
- B. 20.45%
- C. 25.45% ✓
- D. 20.85%

Q8 Mathematics

What sum of money (in ₹) will yield ₹720 as simple interest in 3 years at 6% per annum?

- A. 3500
- B. 4200
- C. 4400
- D. 4,000 ✓

Q9 Mathematics

The value of $27^3 - 22^3$ is:

- **A.** 9035 ✓
- **B.** 8923
- **C.** 8823
- **D.** 8888

Q10 Mathematics

Which number, when added to each of the numbers 2, 3, 11 and 13, will make the resulting numbers in proportion?

- **A.** 5
- **B.** 6
- **C.** 7 ✓
- **D.** 4

Q11 Mathematics

The mean of a data is 20 and its median is 30. The mode (using empirical relation) of the data is:

- **A.** 110
- **B.** 44
- **C.** 131
- **D.** 50 ✓

Q12 Mathematics

A dealer buys two articles X and Y for ₹700 each. He marks each of them at the same price. He sells X by giving two successive discounts of 60% and 20% and still earns ₹630 as profit. If he sells Y at a single discount of 76%, then what is the profit percentage on Y?

- **A.** 42.5% ✓
- **B.** 41%
- **C.** 41.5%
- **D.** 42%

Q13 Mathematics

Pipe A can fill a tank in 12 hours, pipe B in 15 hours, and an outlet C can empty it in 20 hours. A and B are opened together for 5 hours, and then C is also opened. Find the total time to fill the tank.

- **A.** 7.5 तास ✓
- **B.** 6 तास
- **C.** 6.5 तास
- **D.** 5.5 तास

Q14 Mathematics

If the cost of 8 pens is ₹136, then find the cost of 12 such pens.

- **A.** ₹202
- **B.** ₹206
- **C.** ₹204 ✓
- **D.** ₹208

Q15 Mathematics

The difference between the present ages of Ayushi and Nidhi is 26 years. Five years ago from now, the sum of their ages was 30 years. If Ayushi is older than Nidhi, find Nidhi's present age (in years).

- **A.** 6
- **B.** 12
- **C.** 7 ✓
- **D.** 10

Q16 Mathematics

What is the mode of the following data?

47, 43, 50, 46, 46, 40, 54, 54, 40, 54, 42, 48, 44, 55, 52, 45, 41, 41

- **A.** 54 ✓
- **B.** 40
- **C.** 41
- **D.** 46

Q17 Mathematics

The difference between the present ages of Juhi and Surbhi is 24 years. Five years ago from now, the sum of their ages was 66 years. If Juhi is older than Surbhi, find Surbhi's present age (in years).

A. 18
B. 33
C. 20
D. 26 ✓

Q18 Mathematics

If an exterior angle of a regular polygon is 40°, then find the number of diagonals of the polygon.

A. 35
B. 27 ✓
C. 40
D. 45

Q19 Mathematics

Aarju starts a business with ₹55,000 and after 3 months, Bimla joins Aarju as her partner. After a year, the profit is divided in the ratio 8 : 9. What is Bimla's contribution in the capital?

A. ₹84,240
B. ₹82,355
C. ₹84,080
D. ₹82,500 ✓

Q20 Mathematics

If $x = 5 + 2\sqrt{6}$, then find the value of $\frac{x-1}{\sqrt{x}}$.

A. $2\sqrt{2}$ ✓
B. $3\sqrt{2}$
C. $\sqrt{3}+\sqrt{2}$
D. $\sqrt{2}$

Q21 Mathematics

Simplify:

$$\left(\frac{5}{6}+\frac{1}{3}\right)\div\left(\frac{2}{5}+0.3\right)\times 0.5+\frac{1}{2}-\frac{1}{6}$$

A. $\frac{7}{6}$ ✓
B. $\frac{5}{6}$
C. $\frac{1}{6}$
D. $\frac{3}{6}$

Q22 Mathematics

$The\ simplified\ value\ of\ \sqrt{225} + \sqrt{0.04} - \sqrt{4.84}\ is$

A. 13.53

B. 3.82

C. 4.03

D. 13 ✓

Q23 Mathematics

A hollow cylindrical pipe has an external radius of 7 cm, internal radius of 6 cm, and height of 20 cm. Find the total surface area of the pipe (both ends included).

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

A. 1600 cm^2

B. 1485 cm^2

C. 1716 cm^2 ✓

D. 1670 cm^2

Q24 Mathematics

Find the perimeter of the semi-circle of radius 21 cm

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

A. 66 cm

B. 174 cm

C. 87 cm

D. 108 cm ✓

Q25 Mathematics

$\frac{17}{3}\ \frac{29}{3}\ \frac{19}{3}\ \frac{11}{3}$

A. $\frac{17}{3}$

B. $\frac{29}{3}$

C. $\frac{19}{3}$ ✓

D. $\frac{11}{3}$