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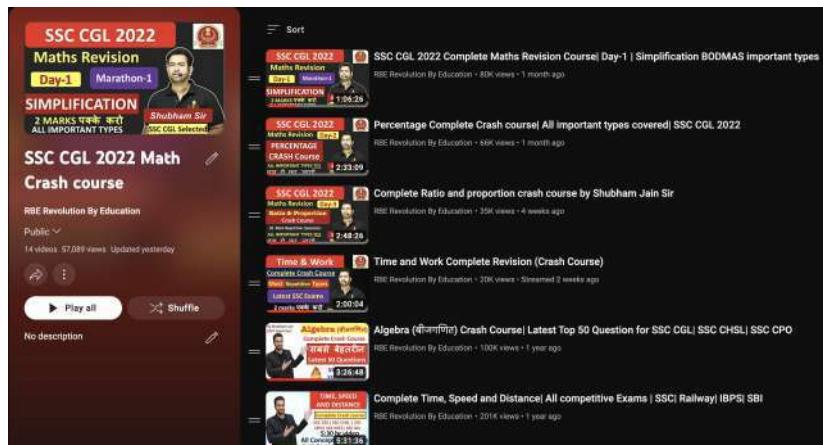


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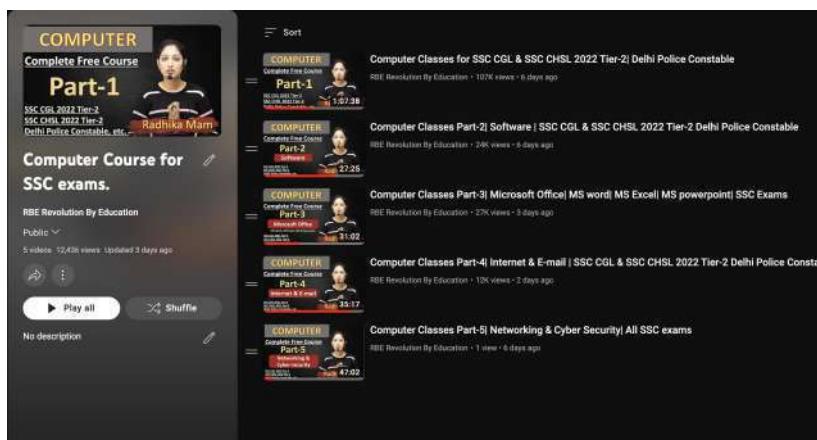
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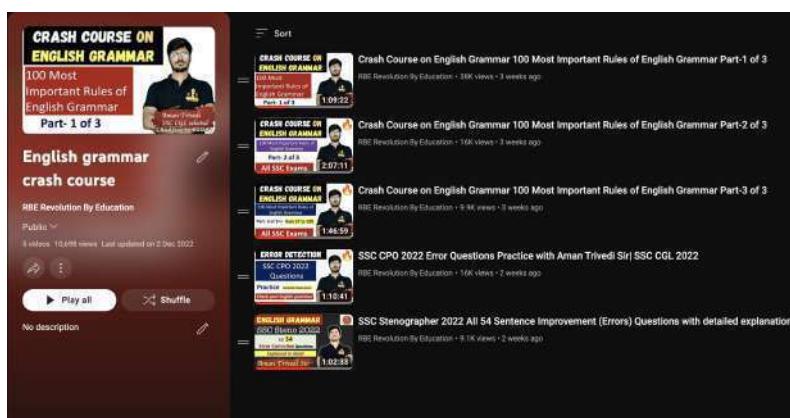
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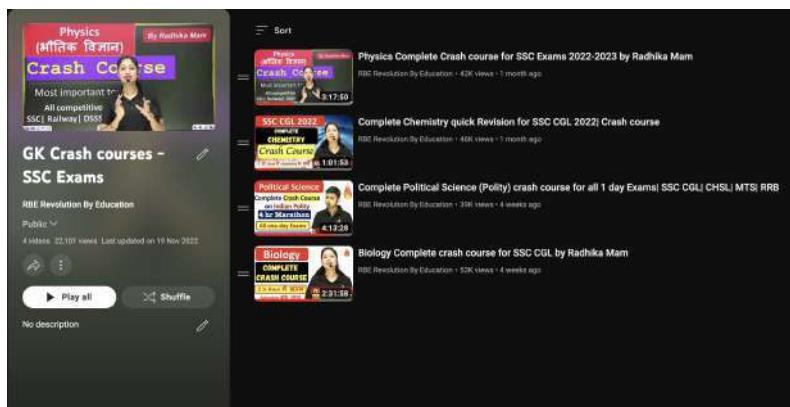
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By: Shubham Jain
(Selected as GST Inspector)
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02/08/2023-> (9:00 AM - 10:00 AM)

A certain amount of money was lent for a period of 1 year 9 months at a rate of 10% per annum compounded

Q.1)- annually. If the compound interest is ₹1,460, find the amount of money lent.

- 1. ₹8,200
- 2. ₹8,000
- 3. ₹7,500
- 4. ₹6,000

A can finish a work in 15 days, B can finish the same work in 25 days. They work together for 5 days. The rest of the work is finished by A and C in 4 days. Then C alone can finish the work in:

- 1. 24 days
- 2. 21 days
- 3. 20 days
- 4. 18 days

Q.3)- A dishonest shopkeeper professes to sell grains at the cost price, but he uses a weight of 920 gm for 1 kg weight. Find his gain percentage (round up to two decimal places).

- 1. 8.50%
- 2. 8.70%
- 3. 7.80%
- 4. 7.90%

Q.4)- Two circles of radii 12 cm and 13 cm are concentric. The length of the chord of the larger circle which touches the smaller circle is:

- 1. 12cm
- 2. 8 cm
- 3. 10 cm
- 4. 18 cm

Q.5)- How long (in years) will a sum of money invested at 6% per annum simple interest to increase its value by 40%?

- 1. $\frac{5}{3}$
- 2. $\frac{4}{3}$
- 3. $\frac{6}{3}$
- 4. $\frac{6}{3}$

Q.6)- In a show room, the marked prices of various items are displayed in such a manner that after giving a 10% discount to the customers, the owner of the show room earns a profit of 20%. What is the ratio of the marked price and cost price of each item?

- 1. 5 : 2
- 2. 4 : 3
- 3. 3 : 4
- 4. 2 : 5

Q.7)- $\frac{\cos\theta}{\sec\theta-1} + \frac{\cos\theta}{\sec\theta+1}$ is equal to :

- 1. $2\sin^2\theta$
- 2. $2\sec^2\theta$
- 3. $2\cot^2\theta$
- 4. $2\cos^2\theta$

Q.8)- A tangent AB at point A of a circle of radius 6 cm meets a line through the centre O at point B. If OB = 10 cm, then the length of AB (in cm) is equal to:

- 1. 8
- 2. 5
- 3. 4
- 4. 6

Q.9)- A shopkeeper marks his goods at 80% more than their cost price and allows a discount of 48% on the marked price. His loss percentage is:

- 1. $3\frac{1}{5}\%$
- 2. $2\frac{1}{5}\%$
- 3. $7\frac{3}{5}\%$
- 4. $6\frac{2}{5}\%$

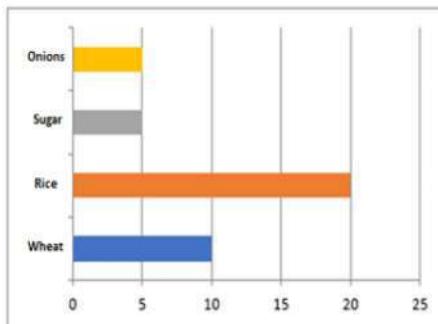
Q.10)- If $\sin A + \sin^2 A = 1$, then the value of the expression $(\cos^2 A + \cos^4 A)$ is _____.

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1. $\frac{3}{2}$ 2. 1 3. $\frac{1}{2}$ 4. 2

The following bar graph indicates the sales of various items in a shop for one day.
Study the bar graph carefully and answer the question that follows.



Find the ratio between the sale of wheat and rice and also the ratio between the sale of sugar and onions, respectively.

Q.11)-

1. 1 : 2 and 1 : 1 2. 1 : 1 and 1 : 1 3. 1 : 1 and 2 : 1 4. 2 : 1 and 1 : 2

Suhas, a 3.15 m tall tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Suhas and the building. The tree is located at a distance of 45 m from the building. Further, the eyes of Suhas, the top of the tree, and the top of the building fall in one line, and the eyes of Suhas are at a height of 1.8 m from the ground. At what distance (in m) from Suhas is the tree located?

Q.12)-

1. 5 2. 6 3. 9 4. 7.5

If a right circular cone of height 24 cm has the circumference of its base 42π cm, then the volume of the cone is

Q.13)- (use $\pi = \frac{22}{7}$):

1. 11088 cm³ 2. 15211 cm³ 3. 21011 cm³ 4. 12034 cm³

Q.14)- If $2x + \frac{2}{x} = 5$, then the value of $(x^3 + \frac{1}{x^3} + 2)$ will be:

1. $\frac{81}{11}$ 2. $\frac{81}{8}$ 3. $\frac{81}{7}$ 4. $\frac{71}{8}$

Q.15)- Which of the following numbers is NOT divisible by 11?

1. 1661308 2. 1904529 3. 1735624 4. 752563

Q.16)- If $5x + 3y = 15$ and $2xy = 6$, then the value of $5x - 3y$ is:

1. $3\sqrt{3}$ 2. $3\sqrt{5}$ 3. $3\sqrt{2}$ 4. $3\sqrt{4}$

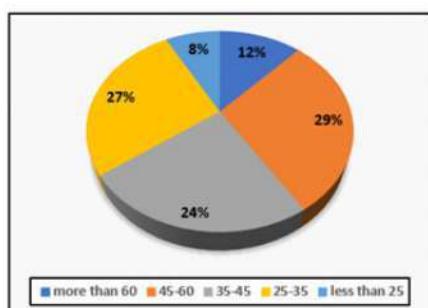
Q.17)- If $\cot\theta = \frac{9}{17}$, find the value of $\operatorname{cosec}^2\theta$.

1. $1\frac{9}{17}$ 2. $\frac{208}{289}$ 3. $1\frac{81}{289}$ 4. $\frac{8}{17}$

Zeenat and Nasreen participate in a circular race of 1.2 km. They start the race at a speed of 18 km/h and 27 km/h, respectively, from the same point at the same time. After how much time (in minutes) will they meet at the starting point for the first time, if they are running in the same direction?

- 1. 8 2. 9 3. 7 4. 10**

Study the given pie-chart and table and answer the question that follows.
The pie-chart shows the percentage distribution of age groups of visitors to a park in a month.



The table shows the male, female distribution of the visitors in terms of the percentage.

Age	Male Percentage	Female Percentage
More than 60	58	42
45-60	80	20
35-45	81	19
25-35	60	40
Less than 25	45	55

If 2000 male visitors and 1500 female visitors were there in all, then the ratio of the number of male visitors in the age group 25-35, to the female visitors of the age group 45-60 is:

- Q.19)- 1. 63 : 47 2. 71 : 45 3. 57 : 41 4. 81 : 29**

Bhushan's monthly income is ₹45,000 and his monthly expenditure is ₹33,000. If his monthly income is increased by 22% while monthly expenditure is increased by 11%, then what is his new monthly savings (in ₹)?

- Q.20)- 1. 18,270 2. 18,000 3. 19,000 4. 18,690**

Q.21)- Find the third proportional of 25 and 45.

- 1. 85 2. 65 3. 81 4. 76**

Study the given table and answer the question that follows.

The table indicates the number of students studying in three disciplines in four different colleges.

Disciplines	Colleges			
	A	B	C	D
Commerce	520	550	515	690
Management	212	234	289	390
Agriculture	234	567	456	876

Q.22)- Which college has the minimum number of students in Commerce?

- 1. B 2. C 3. A 4. D**

Q.23)- The three sides of a triangle are 9, 24 and S units. Which of the following is correct?

- 1. $15 < S < 33$ 2. $15 \leq S \leq 33$ 3. $15 < S \leq 33$ 4. $15 \leq S < 33$**

Q.24)- If $x + \frac{1}{x} = 7$, then the value of $x^2 + \frac{1}{x^2}$ is:

- 1. 47 2. 51 3. 49 4. 5**

The average age of 6 members of a family is 25 years. If the youngest member is 4 years old, then what was the average age of family just before the birth of the youngest member?

- Q.25)- 1. 27.2 years 2. 24.8 years 3. 25.2 years 4. 32.8 years

Answer key

Q.1	2	Q.2	3	Q.3	2	Q.4	3	Q.5	3
Q.6	2	Q.7	3	Q.8	1	Q.9	4	Q.10	2
Q.11	1	Q.12	4	Q.13	1	Q.14	2	Q.15	4
Q.16	2	Q.17	3	Q.18	1	Q.19	4	Q.20	1
Q.21	3	Q.22	2	Q.23	1	Q.24	1	Q.25	3

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02/08/2023-> (11:45 AM - 12:45 PM)

A publisher supplies books to a book-seller at a 20% discount on the list price of ₹1,574.80. If the book-seller sells books at the list price and if his expenses for freight etc. are ₹45.40, determine his profit.

- Q.1)-** 1. ₹269.56 2. ₹285.34 3. ₹273.50 4. ₹282.22

Which of the following numbers is NOT divisible by 6.

- (i) 1,97,232
(ii) 9,72,132
(iii) 8,00,552
Q.2)- (iv) 17,90,184

1. (iii) 2. (ii) 3. (i) 4. (iv)

Q.3)- The value of $\cot 13^\circ \cot 27^\circ \cot 60^\circ \cot 63^\circ \cot 77^\circ$ is:

1. $\sqrt{3}$ 2. 1 3. 0 4. $\frac{1}{\sqrt{3}}$

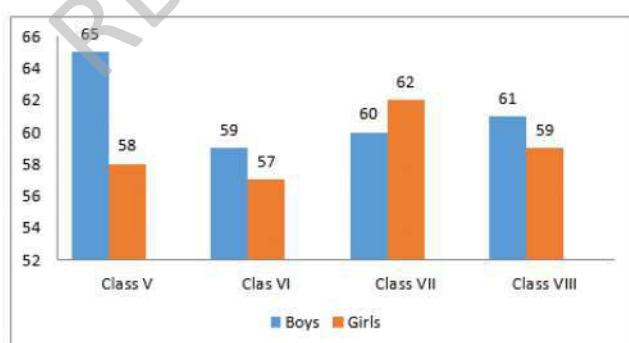
A is a working partner and B is a sleeping partner in a business. A invested ₹30,000 and B invested ₹50,000. A receives 20% of the profit for managing the business and the rest is divided in proportion to their capital. What does B get out of the profit of ₹10,000?

1. ₹4,000 2. ₹4,500 3. ₹5,500 4. ₹5,000

Q.5)- A direct common tangent is drawn to two circles of radius 25 cm and 20 cm. The centres of the two circles are 35 cm apart. What is the length (in cm) of the tangent?

1. $25\sqrt{3}$ 2. $25\sqrt{2}$ 3. $20\sqrt{2}$ 4. $20\sqrt{3}$

The below data gives the number of boys and girls in class V, Class VI, Class VII and Class VIII.



Q.6)- Which class has maximum number of students?

1. VIII 2. VII 3. V 4. VI

A laptop is marked at a price 20% above its cost price. At what discount percentage should it be sold to make a 5% profit?

- Q.7)-** 1. 11.5% 2. 10.5% 3. 12.5% 4. 13.5%

The average weight of group A and group B is 12 kg and 24 kg, respectively. The ratio of the members in group A to group B is 1 : 2. Find the combined average of both the groups.

- Q.8)-** 1. 22 kg 2. 16 kg 3. 20 kg 4. 18 kg

If the price of a movie ticket increased by $12\frac{1}{2}\%$ and the sale of tickets also increased by $8\frac{1}{2}\%$, then find % change in income.

- Q.9)-** 1. 22.0625% 2. 22.6750% 3. 20.675% 4. 21.875%

Q.10)- If $(x + \frac{1}{x}) = 5\sqrt{2}$, and $x > 1$, what is the value of $(x^6 - \frac{1}{x^6})$?

- Q.11)-** 1. $23060\sqrt{23}$ 2. $23030\sqrt{23}$ 3. $22960\sqrt{23}$ 4. $22970\sqrt{23}$

Ramagya sold his computer at three successive discounts of 18%, 12%, and 5%. If the marked price of the computer is ₹36,000, then find the net selling price of the computer. (Correct to two places of decimals.)

- Q.12)-** 1. ₹24,678.72 2. ₹24,786.72 3. ₹24,876.72 4. ₹24,687.72

A computer is available for ₹39,000 on cash payment or ₹19,000 as cash payment followed by five monthly instalments of ₹4,200 each. What is the rate of interest per annum under the instalment plan?

- Q.13)-** 1. $20\frac{20}{29}\%$ 2. $20\frac{19}{29}\%$ 3. $20\frac{18}{29}\%$ 4. $20\frac{17}{29}\%$

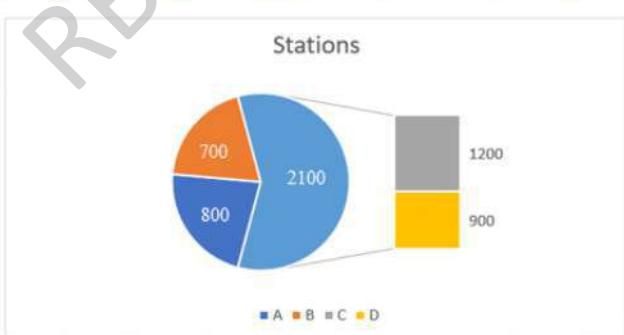
In ΔABC , the straight line parallel to the side BC meets AB and AC at the points P and Q, respectively. If $AP = QC$, the length of AB is 16 cm and the length of AQ is 4 cm, then the length (in cm) CQ is:

- Q.14)-** 1. $(2\sqrt{18} - 2)$ 2. $(2\sqrt{17} - 2)$ 3. $(2\sqrt{21} + 2)$ 4. $(2\sqrt{19} + 2)$

Q.15)- If $(a - b) = 9$, and $(a^3 - b^3) = 4401$, find the value of ab.

1. 162 2. 136 3. 112 4. 190

The number of stations in four different cities A, B, C and D are given below.



Q.15)- The angles made by the cities C and D on pie chart are _____ degrees and _____ degrees, respectively.

1. 120, 90 2. 150, 70 3. 90, 120 4. 70, 150

In a solution of water and milk, the quantity of milk is double the quantity of water. To pass the quality standards, the solution must contain 90% milk in it. If the volume of the solution is v , then how much pure milk in litres is to be added to the solution to pass the quality standard?

Q.16)-

1. $\frac{7}{4}v$ 2. $\frac{4}{3}v$ 3. $\frac{3}{4}v$ 4. $\frac{7}{3}v$

Q.17)- If $A = 60^\circ$, $B = 30^\circ$, then find the value of $\sin A \cos B + \cos A \sin B$.

1. 0 2. 12 3. 1 4. 13

Q.18)- Find the compound interest on ₹50,000 for one year at 8% per annum when compounded half yearly.

1. ₹3,950 2. ₹3,900 3. ₹4,080 4. ₹3,880

Q.19)- A man buys a toy car for ₹225 and sells it for ₹210. Find his loss percentage (round up to two decimal places).

1. 3.33% 2. 6.67% 3. 93.33% 4. 4.44%

Q.20)- If $(a + \frac{1}{a}) = 6$, then what is the value of $\frac{3}{4}(a^2 + \frac{1}{a^2})$?

1. 22.5 2. 25.5 3. 36 4. 34

Aman wants to get his spherical overhead water tank having a diameter of 7 m, painted. If the cost of painting is ₹13 per square metre, find the cost of painting Aman's spherical overhead water tank. (Use $\pi = \frac{22}{7}$)

Q.21)-

1. ₹1,872 2. ₹1,926 3. ₹2,002 4. ₹1,984

Study the table given below and answer the question that follows.

The table below shows the total number of students studying different subjects in a college and the percentage of boys and girls.

Subject	Number of Students	Percentage of Girls	Percentage of Boys
Hindi	110	60	40
English	70	50	50
Physics	50	30	70
Chemistry	40	80	20
Mathematics	80	20	80
Computers	90	40	60

Q.22)- What is the respective ratio of the number of girls studying English to that of girls studying computers?

1. 33 : 35 2. 36 : 23 3. 22 : 23 4. 35 : 36

Q.23)- Which of the following set of angles forms a triangle?

1. $60^\circ, 40^\circ, 80^\circ$ 2. $60^\circ, 50^\circ, 80^\circ$ 3. $60^\circ, 70^\circ, 30^\circ$ 4. $60^\circ, 70^\circ, 80^\circ$

If the distance between the centres of two circles is 12 cm and the radii are 5 cm and 4 cm, then the length (in cm) of the transverse common tangent is:

Q.24)-

1. $\sqrt{63}$ 2. $\sqrt{143}$ 3. 7 4. 9

Q.25)- If $(\sin \theta - \cos \theta) = 0$, then the value of $\sin(\pi - \theta) + \sin\left(\frac{\pi}{2} - \theta\right)$ is:

1. $\sqrt{3}$ 2. 0 3. $\sqrt{2}$ 4. 1

Answer key

Q.1	1	Q.2	1	Q.3	4	Q.4	4	Q.5	4
Q.6	3	Q.7	3	Q.8	3	Q.9	1	Q.10	2
Q.11	1	Q.12	1	Q.13	2	Q.14	2	Q.15	1
Q.16	4	Q.17	3	Q.18	3	Q.19	2	Q.20	2
Q.21	3	Q.22	4	Q.23	1	Q.24	1	Q.25	3

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Q.1)- If $a = \frac{1}{a-\sqrt{6}}$ ($a > 0$), then the value of $\left(a + \frac{1}{a}\right)$ is:

1. $\sqrt{6}$ 2. $\sqrt{7}$ 3. $\sqrt{10}$ 4. $\sqrt{15}$

Q.2)- If the height and slant height of a cone are 21 cm and 29 cm, respectively. Find its volume. (Use $\pi = \frac{22}{7}$)

1. 8708 cm³ 2. 8080 cm³ 3. 8800 cm³ 4. 8440 cm³

Q.3)- A shopkeeper marked a product, 40% above the cost price and sold the product for ₹3,780 by giving a discount of 10%. The profit percentage of the shopkeeper is:

1. 42% 2. 26% 3. 30% 4. 14%

In a circle of radius 14 cm, an arc subtends an angle of 90° at the centre. The length of arc (in cm) is equal to:

Q.4)- Take $\pi = \frac{22}{7}$

1. 20 2. 24 3. 22 4. 18

Q.5)- Two triangles MNO and XYZ are given similar with the ratio of their side as 9 : 4. If the area of the larger triangle is 243 sq.cm, then the area of smaller triangle will be:

1. 48sq.cm 2. 28 sq.cm 3. 162 sq.cm 4. 16 sq.cm

Q.6)- Manoj marked his goods 30% above the Cost Price and gives a 12% discount to the customers. The profit or loss percentage is:

1. 14.4% profit 2. 15% loss 3. 15.4% profit 4. 14.8% loss

Q.7)- Which of the following is the nearest number to 13051 and is divisible by 9?

1. 13056 2. 13059 3. 13058 4. 13057

Q.8)- The average weight of the group of 12 players increases by 1.5 kg when a player who weighs 63 kg is replaced by a new player. What is the weight of the new player?

1. 84 kg 2. 83 kg 3. 79 kg 4. 81 kg

Q.9)- A circle with centre O has a chord AB that is 20 cm in length. If the radius of the circle is 12 cm, then the area of triangle AOB is:

1. $22\sqrt{11}$ cm² 2. $20\sqrt{11}$ cm² 3. $20\sqrt{15}$ cm² 4. $22\sqrt{15}$ cm²

The following table represents the number of five different types of cars A, B, C, D, and E manufactured by a company over five years. Read the table carefully and answer the question given below:

Years/Cars	A	B	C	D	E
2018	2550	2675	2400	2000	450
2019	2600	2800	2550	1900	375
2020	2775	2600	2600	2000	400
2021	2800	2750	2500	1975	475
2022	3000	2800	2650	2100	500

What is the percentage increment in the production of D-type of cars in the year 2022 in comparison to the previous year?

Q.10)- (correct up to two decimal places)

1. 5.95% 2. 6.33% 3. 6.13% 4. 6.95%

Q.11)- If $\sec\theta - \tan\theta = m$, then $2\tan\theta = ?$

1. $\frac{1-m}{m}$ 2. $\frac{1-m^2}{m}$ 3. $\frac{1+m^2}{m}$ 4. $\frac{m^2-1}{m}$

Q.12)- If $\tan\theta = \frac{8}{19}$, find the value of $\sec^2\theta$.

1. $\frac{297}{361}$ 2. $\frac{11}{19}$ 3. $1\frac{8}{19}$ 4. $1\frac{64}{361}$

Q.13)- If $x : y : z = 3 : 4 : 5$, then what will be the ratio of $(\frac{x}{y}) : (\frac{y}{z}) : (\frac{z}{x})$?

1. 37 : 47 : 100 2. 49 : 37 : 100 3. 41 : 37 : 100 4. 45 : 48 : 100

Q.14)- A and B can do a piece of work in 10 days and 15 days, respectively. They worked together, but 5 days before the completion of the work, A left. In how many days was the work completed?

1. 4 2. 9 3. 6 4. 8

Q.15)- Ashima borrowed ₹75,000 from a nationalised bank on 26th March 2022 at the rate of 9% per annum simple interest. If she cleared the account on 7th June of the same year, then what amount did she pay?

1. ₹1,350 2. ₹75,350 3. ₹76,350 4. ₹75,000

Q.16)- In a 5 km race, S gave a 500 m head start to T. If they finished the race at the same time and the speed of T is 13.5 km/h, the speed of S is:

1. 20 km/h 2. 15 km/h 3. 17.5 km/h 4. 16.5 km/h

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The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The number in the brackets gives the maximum marks in each subject.

Students	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

If a student secures 80% or more in a subject, the student is considered to have received a distinction in the subject.

Q.17)- Who among the students below received a distinction in exactly one of the six subjects?

1. Sajal 2. Tarun 3. Tanvi 4. Rohit

Q.18)- In how many years will ₹ 40000 amounts to ₹ 46656 at the rate of 8% compound interest per annum?

1. 4 2. 3 3. 2 4. 5

The cost of 3 breads and 1 packet of juice at a certain store is ₹323.50. At the same store, the cost of 5 breads and 1

Q.19)- packet of juice is ₹433.50. What will be the cost of 2 breads and 2 packets of juice at this store?

1. ₹427 2. ₹433 3. ₹403 4. ₹350

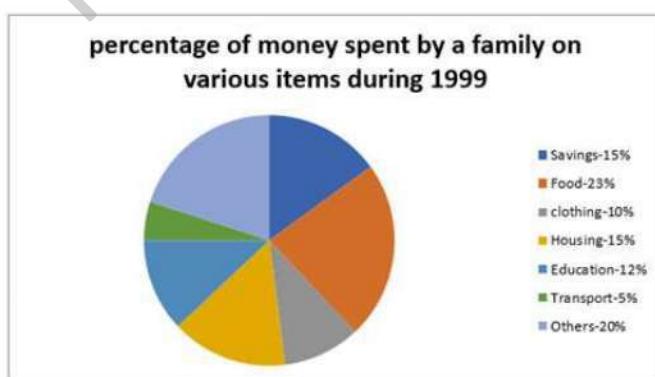
Q.20)- If $\cos \theta + \sec \theta = \sqrt{3}$, then the value of $\cos^3 \theta + \sec^3 \theta$ is:

1. $\frac{1}{\sqrt{3}}$ 2. $2\sqrt{3}$ 3. 0 4. $\sqrt{3}$

Q.21)- Amisha announced a festival discount of 30% on all items in her gift shop. Gurmeet bought a gift for himself. He got a discount of ₹1,110. What was the marked price of the gift?

1. ₹3,750 2. ₹3,650 3. ₹3,850 4. ₹3,700

The pie chart given here shows the spending by a family on various items during the year 1999. Study the graph and answer these questions.



Q.22)- If the total amount spent during the year 1999 was ₹46,000, the amount spent on food was:

1. ₹2,000 2. ₹10,580 3. ₹23,000 4. ₹23,450

Q.23)- If $\cos(3\alpha) = \sin(\alpha - 22^\circ)$, where $3\alpha < 90^\circ$, then what is the value of α ?

1. 27° 2. 26° 3. 28° 4. 29°

Q.24)- S sells an item costing ₹37,800 to P with 8% profit. P sells it to Q with a 4% loss. At what price (in ₹) does P sell the item? (Correct to a nearest rupee)

1. 39,191 2. 39,119 3. 39,919 4. 39,911

Q.25)- If $x = \frac{1}{x-5}$ ($x > 0$), then the value of $x + \frac{1}{x}$ is:

1. $\sqrt{43}$ 2. $\sqrt{29}$ 3. $\sqrt{23}$ 4. $\sqrt{41}$

Answer key

Q.1	3	Q.2	3	Q.3	2	Q.4	3	Q.5	1
Q.6	1	Q.7	2	Q.8	4	Q.9	2	Q.10	2
Q.11	2	Q.12	4	Q.13	4	Q.14	2	Q.15	3
Q.16	2	Q.17	3	Q.18	3	Q.19	1	Q.20	3
Q.21	4	Q.22	2	Q.23	3	Q.24	1	Q.25	2

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02/08/2023-> (5:15 PM - 6:15 PM)

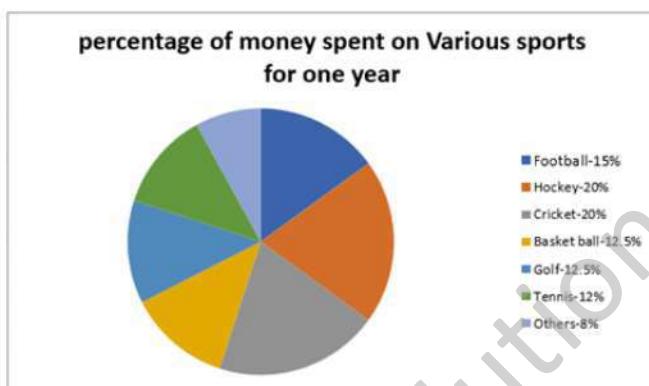
AB = 8 cm and CD = 6 cm are two parallel chords on the same side of the centre of a circle. If the distance between them is 2 cm, then the radius (in cm) of the circle is:

- Q.1)-
1. $\frac{\sqrt{198}}{4}$ 2. $\frac{\sqrt{256}}{4}$ 3. $\frac{\sqrt{156}}{4}$ 4. $\frac{\sqrt{265}}{4}$

Q.2)- If a man purchases kismis at ₹320 per kg and sells it at ₹6 per 25 grams, then his profit/loss percentage is:

1. 25% loss 2. 20% profit 3. 20% loss 4. 25% profit

The pie-chart given here shows the spending of a country on various sports during a year. Study the graph carefully to answer these questions.



Q.3)- If the total amount spent on sports during the year was ₹1,50,00,000, then the amount spent on Cricket and hockey together was:

1. ₹75,00,000 2. ₹50,00,000 3. ₹37,50,000 4. ₹60,00,000

Q.4)- Simplify the given expression. $\frac{4[(17)^2 - (7)^2]}{(17)^2 + (7)^2 + 119}$

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

Q.5)- If $\cos A = \frac{63}{65}$, then find the value of $\tan A + \cot A$ (up to two places of decimal).

1. 3.19 2. 5.23 3. 4.19 4. 2.76

Q.6)- A boy covers a certain distance between his house and school on a cycle. Riding on an average speed of 15 km/h, he is late by 10 min. However, with an average speed of 20 km/h, he reaches the school 5 min earlier. Find the distance between his house and school.

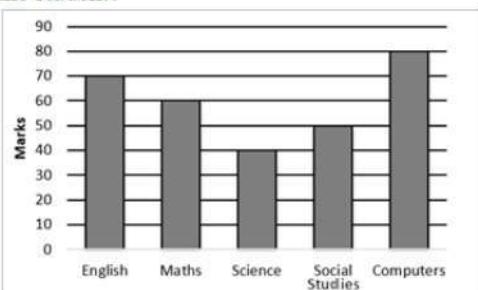
1. 15 km 2. 30 km 3. 25 km 4. 20 km

Q.7)- The population of a village was 12,000 two years ago. If it increased by 2.5% and 3%, respectively, in the last two years, then what is the present population of the village?

1. 12,669 2. 12,607 3. 12,731 4. 12,652

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The below bar graph shows the marks obtained by a student in an examination. What is the average mark obtained by the student?



Q.8)-

1. 60 2. 50 3. 80 4. 30

Simplify the given expression.

$$0.09 \times 0.09 + 0.04 \times 0.04 + 0.16 \times 0.16 + 2 \times 0.09 \times 0.04 + 2 \times 0.04 \times 0.16 + 2 \times 0.09 \times 0.16$$

Q.9)-

$$0.3 \times 0.3 + 0.2 \times 0.2 + 0.4 \times 0.4$$

1. 0.29 2. 0.32 3. 0.38 4. 0.24

Q.10)- Find the average of the prime numbers lying between 51 and 77.

1. 66 2. 64 3. 65 4. 67

A man deposited ₹10,000 at simple interest in a fund. The interest rate on the fund increases by 4% every year. If the

Q.11)- interest rate at the time of the amount deposit was 8%, what is the interest earned (in ₹) by him after 5 years?

1. 8,000 2. 8,400 3. 5,800 4. 6,000

Q.12)- In a triangle ABC, side BC is produced to D such that $\angle ACD = 127^\circ$. If $\angle ABC = 35^\circ$, then find $\angle BAC$.

1. 75° 2. 92° 3. 82° 4. 95°

Q.13)- The value of the expression $4(\sin^6 A + \cos^6 A) - 6(\sin^4 A + \cos^4 A) + 8$ is :

1. 8 2. 4 3. 6 4. 7

The length of each side of an equilateral triangle is 22 cm. Find the area (in cm^2) of

Q.14)- this triangle.

1. 121 2. 242 3. $121\sqrt{3}$ 4. $242\sqrt{3}$

Kapil initiated a business with an investment of ₹30,00,000 in April 2022. After six months, his friend Kunal joined him with an investment of ₹25,00,000. In February 2023, Kapil's Ex – Class fellow Saloni also invested an amount equal to the total investment made by the earlier two partners. In what ratio the profit earned after 3 years from the date on which

Q.15)- Kapil initiated the business, will be distributed?

1. 432 : 400 : 55 2. 108 : 75 : 143 3. 432 : 300 : 55 4. 332 : 200 : 50

Q.16)- The ratio of cost price (CP) and marked price (MP) of an article is 4 : 7. A discount of 20% is given on MP and the shopkeeper made a profit of ₹80. Find the CP of the article.

1. ₹190 2. ₹180 3. ₹170 4. ₹200

AB is a chord of the circle and AOC is its diameter such that angle ACB = 65° . If AT is the tangent to the circle at the

Q.17)- point A, then angle BAT is equal to:

1. 55° 2. 40° 3. 65° 4. 75°

The following table gives the marks scored by 4 students in 4 unit tests of English. Read the table carefully and answer the question that follows.

Name	Unit test 1	Unit test 2	Unit test 3	Unit test 4
Rani	20	22	24	23
Raju	22	18	24	20
Ravi	24	22	20	24
Rekha	20	21	22	23

Q.18)- Whose average marks are the highest among the 4 students?

1. Raju 2. Rekha 3. Rani 4. Ravi

Q.19)- Find the value of the expression $\frac{x^2 - 1}{x - 1} - \frac{x^2 - 9}{x - 3}$.

1. -1 2. -2 3. 2 4. 1

The sum of the radius of the base and the height of a cylinder is 42 m. If the total surface area of the cylinder is 6336

Q.20)- m^2 , find the curved surface area of the cylinder correct to two places of decimals (use $\pi = \frac{22}{7}$).

1. 2157.43 m^2 2. 2571.43 m^2 3. 2715.43 m^2 4. 2517.43 m^2

Two years ago, the population of a small town was 60,000. It increased by 5% in the first year, but due to the pandemic, it decreased by 10% in the second year. What is its present population (after the end of 2 years)?

Q.21)- 1. 56,900 2. 55,700 3. 56,700 4. 3300

A number when divided by 78 gives the quotient 280 and the remainder 0. If the same number is divided by 65, what **Q.22)-** will be the value of the remainder?

1. 0 2. 2 3. 1 4. 3

Q.23)- A shopkeeper marked a product, 5% above the cost price and sold the product for ₹1890 by giving a discount of 10%. The cost price of the product is:

1. ₹2,000 2. ₹1,701 3. ₹2,205 4. ₹2,100

Q.24)- A can do a piece of work in 12 days and B can do the same work in 15 days. If both do the work together, then in how many days will the work be completed?

1. $6\frac{2}{3}$ 2. $8\frac{2}{3}$ 3. $7\frac{2}{3}$ 4. $5\frac{2}{3}$

Q.25)- If $\sin \theta - \cos \theta = \frac{1}{5}$, then find the value of $\sin \theta + \cos \theta$.

1. $\frac{5}{3}$ 2. $\frac{7}{5}$ 3. $\frac{5}{7}$ 4. $\frac{3}{5}$

Q.1	4	Q.2	1	Q.3	4	Q.4	2	Q.5	3
Q.6	1	Q.7	1	Q.8	1	Q.9	1	Q.10	2
Q.11	1	Q.12	2	Q.13	3	Q.14	3	Q.15	2
Q.16	4	Q.17	3	Q.18	4	Q.19	2	Q.20	3
Q.21	3	Q.22	1	Q.23	1	Q.24	1	Q.25	2



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(Selected as GST Inspector)
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03/08/2023-> (9:00 AM - 10:00 AM)

Mohan purchased trousers for ₹765, after a discount of 15% was offered on its marked price. What is the marked price (in ₹) of the trousers?

1. 885 2. 855 3. 870 4. 900

Q.2)- If $\sin \alpha + \cos \alpha = \frac{2}{\sqrt{3}}$, then what is $(\tan \alpha + \cot \alpha)$ equal to?

1. 0 2. 2 3. 6 4. 1

O is the centre of a circle and A is a point on a major arc BC of the circle. $\angle BOC$ and $\angle BAC$ are the angles made by the minor arc BC on the centre and circumference, respectively. If $\angle ABO = 40^\circ$ and $\angle ACO = 30^\circ$, then find $\angle BOC$.

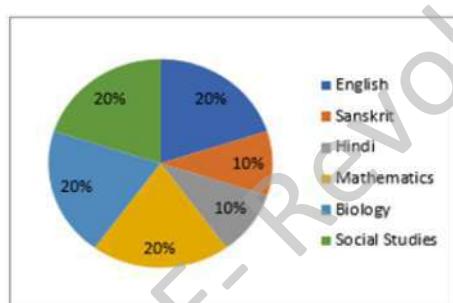
1. 120° 2. 150° 3. 130° 4. 140°

Q.4)- In an isosceles triangle, if the unequal side is 8 cm and equal side is 5 cm, then the area of the triangle is:

1. 12 cm^2 2. 6 cm^2 3. 11 cm^2 4. 25 cm^2

Study the given pie-chart and answer the question that follows.

Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male to female teachers is 3 : 1.



Q.5)- What is the total number of male teachers in the school?

1. 420 2. 450 3. 500 4. 400

Q.6)- The simple interest on a certain sum for 3 years at 8% per annum is ₹ 9120 less than the simple interest on the same sum for 7 years at 8% per annum. Find the sum.

1. ₹ 28750 2. ₹ 28000 3. ₹ 28250 4. ₹ 28500

Q.7)- If $\frac{\cos \theta}{(1 + \sin \theta)} + \frac{\cos \theta}{(1 - \sin \theta)} = 4$ and θ is acute, then the value of θ is;

1. 15° 2. 30° 3. 45° 4. 60°

Q.8)- A circle of radius 5 cm and the length of tangent drawn from a point X outside the circle is 12 cm. The distance of the point X from the centre of the circle is:

1. 11 cm 2. 12 cm 3. 13 cm 4. 10 cm

Ali, Avtar Singh and Ashok working together can finish a work in 8 days. Ali alone can do it in 20 days and Avtar Singh alone can do it in 24 days. In how many days can Ashok alone do the same work?

1. 25 2. 30 3. 26 4. 28

Q.10)- Solve $\left(1 + \frac{5}{6} + \frac{7}{8} + \frac{11}{12}\right) \div \left(\frac{3}{4} - \frac{5}{8}\right)$.

1. 39 2. 49 3. 19 4. 29

Q.11)- $\triangle PQR$ and $\triangle SQR$ are both isosceles triangles on a common base QR such that P and S lie on the same side of QR. If $\angle QSR = 60^\circ$ and $\angle QPR = 100^\circ$, then find $\angle SRP$.

1. 100° 2. 60° 3. 80° 4. 20°

The data given in the following table shows the number of boys and girls enrolled for different games in an academy over 5 years.

Years	Basketball		Football		Cricket	
	Boys	Girls	Boys	Girls	Boys	Girls
2018	46	34	42	37	45	35
2019	40	41	44	34	42	32
2020	43	40	40	32	38	36
2021	37	44	43	25	34	28
2022	34	41	41	32	41	39

Q.12)- In which year did the academy have the highest enrolment?

1. 2018 2. 2022 3. 2019 4. 2020

In a village election between three candidates, 80% of the voters cast their votes, out of which 3% votes were declared invalid. The winning candidate got 42,680 votes which were 55% of the total valid votes. Find the number of valid votes received by the candidate who stood third, given that he received only 10% of the total valid votes.

Q.13)- If a craftsman were to sell a table at ₹1,300, he would lose 35%. To gain 30%, he would sell it for:

1. ₹2,300 2. ₹2,600 3. ₹2,500 4. ₹2,400

Q.14)- If a craftsman were to sell a table at ₹1,300, he would lose 35%. To gain 30%, he would sell it for:

1. ₹2,300 2. ₹2,600 3. ₹2,500 4. ₹2,400

The average monthly salary of workers in a factory is ₹6,000. The average monthly salary of 100 technicians is ₹12,000, and the average monthly salary of non-technicians is ₹4,000. Find the total number of workers in the factory.

Q.15)- 1. 400 2. 250 3. 450 4. 300

Q.16)- Find the value of $\cos 0^\circ + \cos 30^\circ - \tan 45^\circ + \operatorname{cosec} 60^\circ + \cot 90^\circ$.

1. $\frac{7}{6}$ 2. $\frac{\sqrt{3}}{6}$ 3. $\frac{7}{2\sqrt{3}}$ 4. $\frac{7}{6\sqrt{3}}$

The perimeter of a parallelogram is 48 cm. If the height of the parallelogram is 6 cm and the length of the adjacent side is 8 cm, find its area.

1. 84 cm^2 2. 96 cm^2 3. 80 cm^2 4. 90 cm^2

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The data of production (in million) of three types of medicines by three different companies is given below.

Medicine → Company ↓	P	Q	R
A	1.125	2.220	2.100
B	2.225	1.175	2.500
C	1.550	1.750	1.950

Q.18)- Which of the following gives the minimum production of a medicine by any company?

1. Medicine Q, Company C 2. Medicine P, Company A 3. Medicine P, Company C 4. Medicine Q, Company B

Simplify the following expression.

Q.19)- $0.01 + 0.68 \times 0.68 + 0.22 \times 0.22 + 0.044 + 0.136 + 0.44 \times 0.68$

1. 0.69 2. 0.8 3. 1 4. 0.9

Q.20)- If $2x + 3y = 9$, and $xy = 3$, what is $8x^3 + 27y^3$?

1. 234 2. 243 3. 235 4. 244

A train starts from a station P for another station Q at 6 p.m. at an average speed of 75 km per hour. Another train starts from station Q for station P at 8 p.m. at an average speed of 105 km per hour. If the distance between these two stations

Q.21)- is 690 km, then at what time will the two trains meet?

1. 10:30 p.m. 2. 11 p.m. 3. 11:30 p.m. 4. 10 p.m.

Q.22)- If $\sqrt{\frac{a}{b}} = \frac{8}{3} + \sqrt{\frac{b}{a}}$ and $(a + b) = 30$, then what is the value of ab?

1. 36 2. 64 3. 81 4. 28

A sum of money is divided among A, B, C in the ratio 3 : 2 : 5, respectively. If the share of C is ₹300 more than B, then

Q.23)- how much more money will A get than B?

1. ₹125 2. ₹75 3. ₹100 4. ₹150

In April 2019, Dinesh purchased a new car for ₹7,00,000 and sold it in April 2022 at its depreciated cost. If the rate of depreciation in the first year is 20%, 15% in the second year and 10% every year thereafter, what amount of money will

Q.24)- Dinesh get as the selling price?

1. ₹4,28,600 2. ₹4,68,400 3. ₹4,28,400 4. ₹5,28,400

Catch Cola 300 ML with MRP ₹20 is displayed in a Hyper Market with an Offer 'BUY 2 GET 1 FREE'. With this offer, the Hyper Market is giving what per cent discount?

1. 20% 2. 33.33% 3. 50% 4. 40%

Q.1	4	Q.2	3	Q.3	4	Q.4	1	Q.5	2
Q.6	4	Q.7	4	Q.8	3	Q.9	2	Q.10	4
Q.11	4	Q.12	1	Q.13	2	Q.14	2	Q.15	1
Q.16	3	Q.17	2	Q.18	2	Q.19	3	Q.20	2
Q.21	2	Q.22	3	Q.23	3	Q.24	3	Q.25	2



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03/08/2023-> (11:45 AM - 12:45 PM)

Q.1)- If $\left(z + \frac{1}{z}\right) = 4$, then what will be the value of $\frac{1}{2} \left(z^2 + \frac{1}{z^2}\right)$?

- 1. 14
- 2. 8
- 3. 16
- 4. 7

Q.2)- A sum amounts to ₹6,120 in 2 years and ₹7,340 in 3 years at compound interest. The sum (in ₹) is (rounded off to 2 decimal places):

- 1. 4,560.23
- 2. 4,850.32
- 3. 4,254.63
- 4. 4,050.13

Q.3)- Two parallel lines touch the circles at P and Q. Area of the circle is 154 cm^2 . Find the length of PQ (Take $\pi = \frac{22}{7}$).

- 1. 77 cm
- 2. 58.2 cm
- 3. 7 cm
- 4. 14 cm

Q.4)- The price of a certain mobile set is discounted by 10% and the reduced price is then discounted by 10%. This series of successive discounts is equivalent to a single discount of:

- 1. 19%
- 2. 18%
- 3. 16%
- 4. 17%

Q.5)- Find the volume of the largest possible sphere circumscribed by a cube of edge 7 cm.

- 1. 189.67 cm^3
- 2. 179.67 cm^3
- 3. 199.67 cm^3
- 4. 169.67 cm^3

Q.6)- In a triangle DEF, DP is the bisector of $\angle D$, meeting EF at P. If DE = 14 cm, DF = 21 cm, and EF = 9 cm, find EP.

- 1. 3.6 cm
- 2. 5.4 cm
- 3. 6.3 cm
- 4. 2.7 cm

Q.7)- The value of $(\cosec^2 B - 1)(\sec^2 B - 1)$ is:

- 1. 3
- 2. 4
- 3. 1
- 4. 2

Q.8)- If $\sin \theta + \cos \theta = \frac{1}{29}$, find the value of $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta}$.

- 1. $\frac{1}{43}$
- 2. $\frac{43}{29}$
- 3. $\frac{41}{29}$
- 4. $\frac{1}{41}$

Q.9)- Simplify the given expression. $\frac{4913+343}{289+49-119}$

- 1. 20
- 2. 24
- 3. 22
- 4. 26

Q.10)- Babita is 1.25 times as efficient as Deepak. Working together the duo can complete a piece of work in 40 days. In how many days can Deepak alone complete the same piece of work?

- 1. 100
- 2. 84
- 3. 90
- 4. 96

The divisor is 10 times the quotient and 5 times the remainder in a division sum. What is the dividend if the remainder is 46?

- Q.11)-**
 1. 5336 2. 4286 3. 5972 4. 4874

Rajinder drives his car at an average speed of 40 km per hour to cover half of his total distance and thereafter he increases his speed to 60 km per hour. He covers his journey in 7 hours. What is the average speed of Rajinder in this journey?

Q.12)-

1. 48 km per hour 2. 50 km per hour 3. 54 km per hour 4. 52 km per hour

A profit earned by selling an article for ₹1,032 is equal to the loss incurred when the same article is sold for ₹648. What should be the selling price of the article if the profit is 30%?

- Q.13)-**
 1. ₹998 2. ₹1,092 3. ₹1,050 4. ₹2,520

The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The number in the brackets gives the maximum marks in each subject.

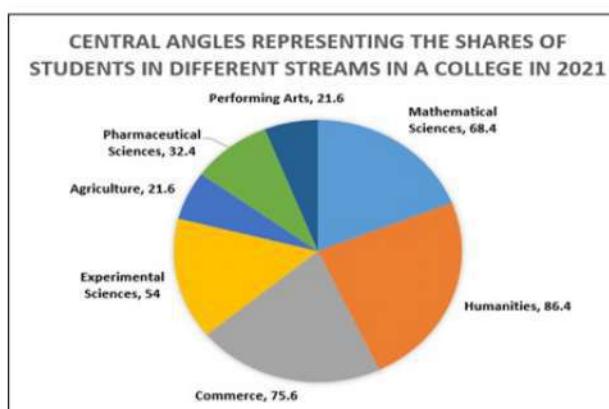
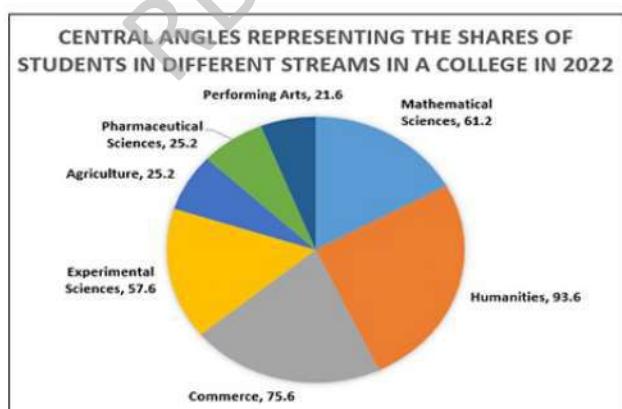
Students	Subject (Max. Marks)					
	Maths (150)	Chemistry (130)	Physics (120)	Geography (100)	History (60)	Computer Science (40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

Q.14)- How many students secured more than 70% marks in Geography?

1. 3 2. 4 3. 5 4. 6

Q.15)-

The shares of students studying in different streams of a college in the years 2021 and 2022 are as reflected in the two pie charts given below.



The total number of students opting for humanities in the college was 15600 in both the given years. What was the percentage change in the total number of students in the college from 2021 to 2022? [Give your answer correct to the nearest integer value]

Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

https://t.me/RBE_S

YouTube (Free lectures and job updates): <https://www.youtube.com/c/RBERevolutionByEducation>

1. 7% 2. 6% 3. 8% 4. 9%

Q.16)- Which option with given sides forms a Triangle?

1. 8, 6, 9 2. 10, 25, 11 3. 8, 2, 6 4. 100, 200, 300

A contractor employed 69 workers to complete a work in 20 days. How many more workers he should employ to complete the work in 12 days?

1. 46 workers 2. 51 workers 3. 115 workers 4. 64 workers

If $p + q + r = 0$, then what is the simplified value of the expression

Q.18)- $\left(\frac{p^2}{p^2-qr} + \frac{q^2}{q^2-pr} + \frac{r^2}{r^2-pq} \right)$?

1. 1 2. 2 3. 0 4. -1

Q.19)- Find the fourth proportion to 0.24, 0.6 and 20.

1. 50 2. 24 3. 54 4. 48

Mohan completed a certain journey by car. If he covered 30% of the distance at 90 km/h, 45% of the distance at

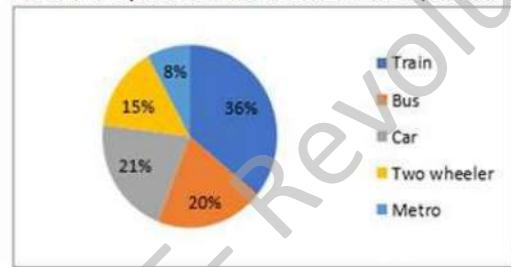
Q.20)- 135 km/h and the remaining distance at 75 km/h. His average speed (in km/h) for the entire journey is:

1. 105 2. 95 3. 90 4. 100

Q.21)- If $\cot B = \frac{15}{8}$, where B is an acute angle, what is the value of $\sec B + \tan B$?

1. $\frac{5}{4}$ 2. $\frac{3}{5}$ 3. $\frac{4}{5}$ 4. $\frac{5}{3}$

Pie chart represents the modes of transport used by different employees in a university.



Q.22)- The central angle of the sector for officers using two wheeler is:

1. 72° 2. 36° 3. 54° 4. 46°

In a circle with radius 20 cm, X is a point located at a distance of 29 cm from the centre of the circle. What will be the

Q.23)- length (in cm) of a tangent drawn from point X to the circle?

1. 21 2. 23 3. 18 4. 20

A trader allows a 40% discount on his goods, but he loses 30% on them. Find the percentage of the marked price above the cost price.

1. $16\frac{2}{3}\%$ 2. $15\frac{2}{3}\%$ 3. $16\frac{1}{3}\%$ 4. $15\frac{1}{3}\%$

Sudesh is the owner of a multipurpose shop. For a specific month, his profits are detailed below.

Category	Profit earned in ₹
Groceries	50,000
Cosmetics	20,000
Ladies' dresses	10,000

In order to estimate the expected profit for the next month, he assigns the weights of 6, 5 and 8 to the different categories in the same order.

Q.25)- What will be the weighted average of his profits?

1. ₹25,263.16 (nearly) 2. ₹25,265.18 (nearly) 3. ₹25,163.16 (nearly) 4. ₹24,863.16 (nearly)

Answer key

Q.1	4	Q.2	3	Q.3	4	Q.4	1	Q.5	2
Q.6	1	Q.7	3	Q.8	4	Q.9	2	Q.10	3
Q.11	1	Q.12	1	Q.13	2	Q.14	2	Q.15	3
Q.16	1	Q.17	1	Q.18	2	Q.19	1	Q.20	4
Q.21	4	Q.22	3	Q.23	1	Q.24	1	Q.25	1



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By: Shubham Jain
(Selected as GST Inspector)
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03/08/2023-> (2:30 PM - 3:30 PM)

A tailor buys lining clothes from a wholesale merchant and cheats him by using a measurement tape which is 5 cm longer than the normal tape. The tailor offers the customers at cost price while stitching different garments and uses measurement tape which is 5 cm shorter than the normal tape. The gain per cent is:

Q.1)-

1. $10 \frac{10}{19}\%$ 2. 10% 3. 15% 4. $10 \frac{10}{25}\%$

Q.2)-

The fourth proportional of 1.4, 8.4 and 4.2 is:

1. 0.7 2. 2.8 3. 6.4 4. 25.2

In a triangle PQR, QR is produced to S. If $\angle PRS = (9x - 15)^\circ$, $\angle RPQ = (2x)^\circ$, and $\angle PQR = (4x + 15)^\circ$, what is

Q.3)-

the value of x ?

1. 10 2. 75 3. 55 4. 20

Q.4)-

What price should a tradesman mark on an article which costs him ₹153 to gain 20% after allowing a discount of 15%?

1. ₹416 2. ₹216 3. ₹316 4. ₹116

Q.5)-

The marked price of the cupboard is ₹15,750, which is 50% above its cost price. It is sold at a discount of 40%. What is the profit/loss percentage?

1. Loss, 10% 2. Loss, 20% 3. Profit, 10% 4. Profit, 20%

Q.6)-

If $(y + \frac{1}{y}) = 8$, find the value of $(y^2 + \frac{1}{y^2})$.

1. 62 2. 66 3. 60 4. 64

Q.7)-

If $a + b = 10$ and $a^2 + b^2 = 58$, find the value of ab .

1. 30 2. 27 3. 24 4. 21

Q.8)-

The cost of 3 cups and 5 plates is ₹1,080 and the cost of 2 cups and 4 plates is ₹840. Find the ratio of the cost of a cup to the cost of a plate.

1. 1 : 1 2. 2 : 3 3. 1 : 2 4. 1 : 3

Q.9)-

If in $\triangle PQR$ and $\triangle DEF$, $\angle P = 52^\circ$, $\angle Q = 74^\circ$, $\angle R = 54^\circ$, $\angle D = 54^\circ$, $\angle E = 74^\circ$ and $\angle F = 52^\circ$, then which of the following is correct?

1. $\triangle RQP \sim \triangle FED$ 2. $\triangle PQR \sim \triangle DEF$ 3. $\triangle PRQ \sim \triangle FED$ 4. $\triangle PQR \sim \triangle FED$

Q.10)-

$\cos^4 A - \sin^4 A$ is equal to:

1. $2 \sin^2 A - 1$ 2. $2 \cos^2 A + 1$ 3. $1 - 2 \sin^2 A$ 4. $-(2 \sin^2 A + 1)$

Q.11)-

In a 1 km race, P completes the race in 120 seconds and Q in 125 seconds. The distance by which P beats Q is:

1. 20 metres 2. 40 metres 3. 80 metres 4. 60 metres

Study the given table and answer the question that follows.

The table shows the percentage of female employees in various departments of a company.

Department	Percentage of Female Employees
Production	55
R & D	60
Purchase	40
Accounts	10
Administration	50
Total	41.51

If accounts department has 198, R & D has 100 male employees, then the total number of female employees in Q.12)- these two departments will be:

1. 172 2. 185 3. 168 4. 144

Q.13)- What is the compound interest on ₹62,500 for 2 years at 8% per annum compounded yearly?

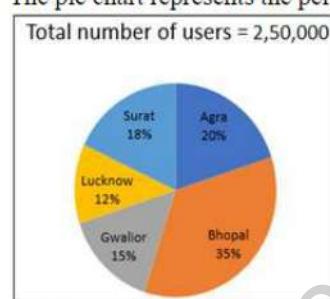
1. ₹10,600 2. ₹10,400 3. ₹10,300 4. ₹10,500

Q.14)- Find the fourth proportion for 15, 55 and 81.

1. 231 2. 335 3. 297 4. 313

Study the given pie chart and answer the question that follows.

The pie chart represents the percentage of magazine users in five different cities of India.



Q.15)- What is the central angle made by Bhopal city in the pie chart?

1. 128° 2. 126° 3. 124° 4. 122°

Q.16)- If the simple interest on a certain sum of money is ₹11,220 at the rate of $16\frac{1}{2}\%$ per annum for 8 years and 3 months, then what is the principal amount (in ₹, rounded off to the nearest rupee)?

1. 8,242 2. 8,422 3. 4,228 4. 6,822

Q.17)- If $a^2 + \frac{1}{a^2} = \frac{7}{3}$, then what is the value of $(a^3 - \frac{1}{a^3})$?

1. $\frac{10}{3\sqrt{3}}$ 2. $\frac{7}{3\sqrt{3}}$ 3. $\frac{5}{3\sqrt{3}}$ 4. $\frac{8}{3\sqrt{3}}$

Q.18)- A bottle is filled with liquid of which 4 parts are water and 5 parts are fruit extract. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half fruit extract?

- 9 1 4 5
 1. $\frac{9}{10}$ 2. $\frac{1}{10}$ 3. $\frac{4}{9}$ 4. $\frac{5}{9}$

Two circles of radii 15 and 18 cm touch each other externally. What is the length (in cm) of the direct common tangent to the two circles?

1. $30\sqrt{6}$ 2. $12\sqrt{15}$ 3. $6\sqrt{30}$ 4. $18\sqrt{6}$

Q.20)- $\sin^2 35^\circ + \sin^2 55^\circ = \underline{\hspace{2cm}}$.

1. $2\sin 55^\circ$ 2. 0 3. $2\sin 35^\circ$ 4. 1

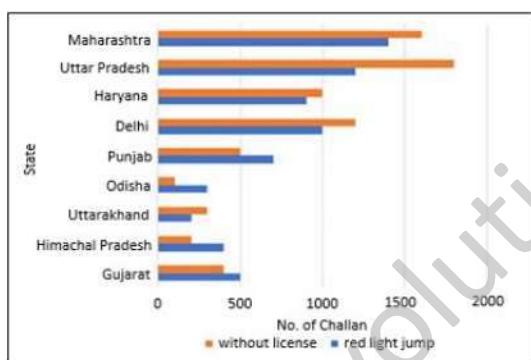
How much chicory, costing ₹100/kg should be added to 40 kg of coffee costing ₹45/kg so that the mixture will be worth ₹60/kg?

1. 17.5 kg 2. 15 kg 3. 12.5 kg 4. 5 kg

Two circles touch each other externally, having a radius of 12 cm and 8 cm, respectively. Find the length of their common tangent AB with point A on bigger circle and B on the smaller circle.

1. $12\sqrt{6}$ cm 2. $12\sqrt{3}$ cm 3. $8\sqrt{6}$ cm 4. $8\sqrt{3}$ cm

The bar graph represents the number of challan in 9 states of India.



The percentage of without license challan in Delhi is how much more than those in Uttarakhand and Himachal Pradesh together?

1. 250% 2. 300% 3. 120% 4. 140%

The given expression is equal to:

Q.24)-
$$\frac{(1+\tan^2 A)}{\cosec^2 A \cdot \tan A}$$

1. $\sec^2 A$ 2. $\tan A$ 3. $\tan^2 A$ 4. $\sec A$

The length, breadth, and height of a room are 7 m, 5 m and 3 m, respectively. Find the cost of whitewashing the walls of the room and the ceiling at the rate of ₹16 per m^2 .

1. ₹1,712 2. ₹1,698 3. ₹1,742 4. ₹1,684

Q.1	1	Q.2	4	Q.3	1	Q.4	2	Q.5	1
Q.6	1	Q.7	4	Q.8	4	Q.9	4	Q.10	3
Q.11	2	Q.12	1	Q.13	2	Q.14	3	Q.15	2
Q.16	1	Q.17	1	Q.18	2	Q.19	3	Q.20	4
Q.21	2	Q.22	3	Q.23	4	Q.24	2	Q.25	1



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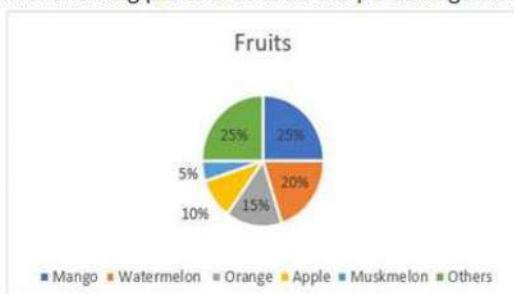


03/08/2023-> (5:15 PM - 6:15 PM)

A boat goes 10 km upstream in 50 minutes, and the speed of the stream is 3 kmph. Find the speed of the boat in still water (in kmph).

- Q.1)-
1. 8 2. 15 3. 12 4. 10

The following pie-chart shows the percentage distribution of different fruits in a market.



Q.2)- There are 15,000 kg of oranges in the market. Find the quantity of muskmelon and watermelon together.

1. 20,000 kg 2. 25,000 kg 3. 5,000 kg 4. 10,000 kg

Q.3)- What is the least value of $x+y$, if 10 digit number $780x533y24$ is divisible by 88?

1. 2 2. 1 3. 3 4. 4

Q.4)- If $\cot A + \cos A = p$ and $\cot A - \cos A = q$, then which of the following relation is correct?

1. $\frac{1}{4pq} = p^2 + q^2$ 2. $\sqrt{\frac{1}{16pq}} = p^2 + q^2$ 3. $\sqrt{16pq} = p^2 - q^2$ 4. $4pq = p^2 + q^2$

Q.5)- If $\sin(p+q) = 1$ and $\cos(p-q) = \frac{\sqrt{3}}{2}$, find p.

1. 120° 2. 80° 3. 60° 4. 90°

The following table represents the number of candidates who appeared (A) and passed (P) in a screening test over four years from four different states. Read the table carefully and answer the question given below:

States/ Years	Assam		Bihar		Kerala		Uttar Pradesh	
	A	P	A	P	A	P	A	P
2019	2500	1400	4200	3200	2800	2200	4500	3600
2020	2700	1500	4500	3400	3000	2400	4600	3700
2021	2900	1800	4700	3800	3400	2500	4800	3800
2022	3000	1900	5000	3900	3500	2600	5200	4100

Q.6)- What is the average number of appearing candidates in the screening test from all the four states in the year 2021?

1. 4000 2. 3950 3. 3900 4. 3850

Shobha purchased a saree for ₹5,130 after availing two successive discounts of 10% and 5%. What is the marked price

Q.7)- of the saree?

1. ₹6,000
2. ₹5,400
3. ₹5,000
4. ₹5,200

Minor arc BC subtends angles BAC and BDC at points A and D, respectively, on the circumference in the major

Q.8)- sector of the circle with centre O. What is the value (in degrees) of ($\angle ABC + \angle ACB$), if $\angle BDC = 73^\circ$?

1. 107°
2. 117°
3. 103°
4. 113°

The ratio of the number of men to the number of women in an office is 2 : 3. If the average weights of the men and the

Q.9)- women in the office are 56 kg and 51 kg, respectively, find the average weight of the employees in the office (in kg).

1. 53.5
2. 54.5
3. 53
4. 54

The radius of a circle is 3 cm and 'O' is its centre. The length of the tangent (in cm) to the circle drawn from a point P,

Q.10)- which is at a distance of 5 cm from 'O' is:

1. 5
2. 6
3. 4
4. 3

Q.11)- The difference between the total surface area and the lateral surface area of a cube of side 12 cm is:

1. 286 cm^2
2. 292 cm^2
3. 288 cm^2
4. 290 cm^2

The distance between the centres of two circles having radii of 24 cm and 18 cm, respectively, is 48 cm. Find the length

Q.12)- (in cm) of a direct common tangent to the two circles.

1. $18\sqrt{7}$
2. $22\sqrt{5}$
3. $20\sqrt{6}$
4. 45

Q.13)- What is the present value of the sum if the interest compounded at the rate of 18% per annum for two years is ₹981?

1. ₹2,400
2. ₹3,600
3. ₹2,800
4. ₹2,500

A vendor earns 10% on an investment but loses 10% on another investment. What will be the combined loss or gain if

Q.14)- the two investments are in the ratio 1 : 3?

1. 5% loss
2. 5% gain
3. 4% gain
4. 4% loss

Q.15)- If $\operatorname{cosec}\theta = 1\frac{7}{22}$, find the value of $\cot^2\theta$.

1. $\frac{357}{484}$
2. $\frac{49}{484}$
3. $\frac{225}{484}$
4. $\frac{7}{22}$

A bag is listed at ₹1,500 and a discount of 20% is offered. If the customer wanted to get the bag at a net price of

Q.16)- ₹1,104, what additional discount must be offered to the customer?

1. 10%
2. 5%
3. 8%
4. 4%

Q.17)- The compound ratio of 3 : 4 and 6 : 7 is 36 : x. Find x.

1. 75
2. 56
3. 48
4. 64

Q.18)- If $2a + 3b = 14$ and $2a - 3b = 10$, then find the value of 'ab'.

1. 3
2. 4
3. 5
4. 2

Q.19)- If $x^3 = 270 + y^3$ and $x = (6 + y)$, then what is the value of $(x + y)$? (given that $x > 0$ and $y > 0$)

1. $4\sqrt{2}$ 2. $2\sqrt{3}$ 3. $4\sqrt{3}$ 4. $\sqrt{3}$

Q.20)- A person, who spends 68% of his monthly income, is able to save ₹14,720 per month. Find his total expenses.

1. ₹38,210 2. ₹31,280 3. ₹46,000 4. ₹42,400

The given table shows the number of berths reserved in trains A, B and C on a particular day under different classes. Study the given table and answer the question that follows.

Trains	AC-1 st class capacity-200	AC-sleeper capacity-200	AC-chair car capacity-400	First class capacity-300	2 nd class capacity-500
A	186	201	313	282	487
B	190	183	348	215	414
C	198	191	364	291	484

Q.21)- How many berths in all the classes together are vacant in Trains B and C?

1. 612 2. 322 3. 278 4. 534

Disha takes 12 hours to copy a 75-page manuscript, while Mohit can copy the same manuscript in 10 hours. How many

Q.22)- hours will it take for them to copy a 150-page manuscript if they work together?

1. $8\frac{9}{11}$ hours 2. $9\frac{9}{11}$ hours 3. $10\frac{10}{11}$ hours 4. $11\frac{8}{11}$ hours

Q.23)- In ΔABC , the internal bisectors of $\angle ABC$ and $\angle ACB$ meet at X and $\angle BAC = 30^\circ$. The measure of $\angle BXC$ is:

1. 105° 2. 150° 3. 120° 4. 115°

A financial institution claims that it returns three times the principal in 25 years on a certain rate of simple interest per annum. What is the rate of simple interest?

1. 4% 2. 5% 3. 8% 4. 6%

Q.25)- If $(a+b+c) \neq 0$, then $(a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$ is equal to:

1. $a^3 + b^3 + c^3 + 3abc$ 2. $a^3 + b^3 + c^3 - 3abc$ 3. $a^3 - b^3 + c^3 - 3abc$ 4. $a^3 + b^3 - c^3 - 3abc$

Answer key

Q.1	2	Q.2	2	Q.3	1	Q.4	3	Q.5	3
Q.6	2	Q.7	1	Q.8	1	Q.9	3	Q.10	3
Q.11	3	Q.12	1	Q.13	4	Q.14	1	Q.15	1
Q.16	3	Q.17	2	Q.18	2	Q.19	3	Q.20	2
Q.21	2	Q.22	3	Q.23	1	Q.24	3	Q.25	2



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04/08/2023-> (9:00 AM - 10:00 AM)

A total of 7,50,000 voters participated in an election. A candidate received 3,82,500 votes which was 60% of the total valid votes. What was the percentage of invalid votes in the election?

Q.1)-

1. 15%
2. 18%
3. 20%
4. 12%

Q.2)- In a triangle ABC, two angles A and B are equal. If the exterior angle at $\angle A = 115^\circ$, find the measure of $\angle C$.

1. 50°
2. 130°
3. 65°
4. 115°

If the difference between the compound interest and simple interest on a certain sum of money for 3 years at the rate of 4% per annum is ₹76, then what is the sum?

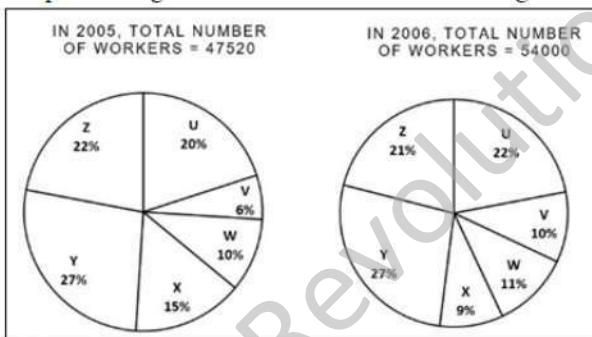
Q.3)-

1. ₹12,925
2. ₹15,625
3. ₹16,725
4. ₹18,825

Q.4)- Simplify:
$$\frac{(3.321)^3 + (2.681)^3 + (1.245)^3 - 3 \times 3.321 \times 2.681 \times 1.245}{(3.321)^2 + (2.681)^2 + (1.245)^2 - (3.321 \times 2.681) - (2.681 \times 1.245) - (1.245 \times 3.321)} = ?$$

1. 7.247
2. 10.245
3. 8.645
4. 6.125

The pie charts given below show the workers doing different types of works in an office in 2005 and 2006.



The total number of workers of which two types of work in 2005 was equal to the number of workers doing U-type of work in 2006?

Q.5)-

1. X and Y
2. V and W
3. W and X
4. U and W

Simplify the expression:

$$Q.6)- \frac{(u-v)^3 + (v-w)^3 + (w-u)^3}{(u^2-v^2)^3 + (v^2-w^2)^3 + (w^2-u^2)^3}$$

1. $\frac{1}{(u+v)(v+w)(w+u)}$
2. 0
3. $\frac{3}{(u+v)(v+w)(w+u)}$
4. 1

Two men do the same journey by travelling at the speed of 18 km/h and 24 km/h, respectively. If one man takes 20 minutes more than the other man, then the distance (in km) of the total journey is:

Q.7)-

1. 24
2. 20
3. 21
4. 18

Milk and water in two vessels A and B are in the ratio 5 : 3 and 2 : 3, respectively. In what ratio should the liquids in both the vessels be mixed to obtain a new mixture in vessel C containing half milk and half water?

Q.8)-

Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

https://t.me/RBE_S

YouTube (Free lectures and job updates): <https://www.youtube.com/c/RBERevolutionByEducation>

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

What will be the amount due on ₹25,000 in 2 years when the rate of simple interest on successive years is 4% and 5%, respectively?

1. ₹28,250 2. ₹27,250 3. ₹26,250 4. ₹26,000

What is the value of the expression

Q.9)- $\sin A \left(1 + \frac{\sin A}{\cos A}\right) + \cos A \left(1 + \frac{\cos A}{\sin A}\right)$?

1. $\sin A - \cos A$ 2. $\sin A + \cos A$ 3. $\sec A - \operatorname{cosec} A$ 4. $\sec A + \operatorname{cosec} A$

Q.11)- Akash bought an old phone for ₹3,450 and spent ₹450 on its repair. He sold it for ₹5,070. His profit percent is:

1. 20% 2. 40% 3. 10% 4. 30%

यदि 120° के कोण पर द्वुकी हुई दो स्पर्श रेखाएँ 6 cm त्रिज्या के एक वृत्त पर खींची जाती हैं, तो प्रत्येक स्पर्श रेखा की लंबाई (cm में) क्या होगी?

1. $3\sqrt{3}$ 2. $4\sqrt{3}$ 3. $2\sqrt{3}$ 4. $\sqrt{3}$

Q.13)- What is the largest five digit number exactly divisible by 88?

1. 99984 2. 99992 3. 99986 4. 99968

Q.14)- The value of the expression [$\cot 1^\circ, \cot 2^\circ, \cot 3^\circ, \cot 4^\circ, \cot 5^\circ, \dots, \cot 178^\circ, \cot 179^\circ$] is:

1. 1235 2. 0 3. 1 4. $\frac{1}{2}$

In triangle RST, M and N are two points on RS and RT such that MN is parallel to the base ST of the triangle RST. If

Q.15)- $RM = \frac{1}{3} MS$, and $ST = 5.6$ cm, what is the ratio of $\frac{\text{Area of Triangle } RMN}{\text{Area of Trapezium } MNST}$?

1. $\frac{1}{15}$ 2. $\frac{14}{15}$ 3. $\frac{1}{16}$ 4. $\frac{15}{16}$

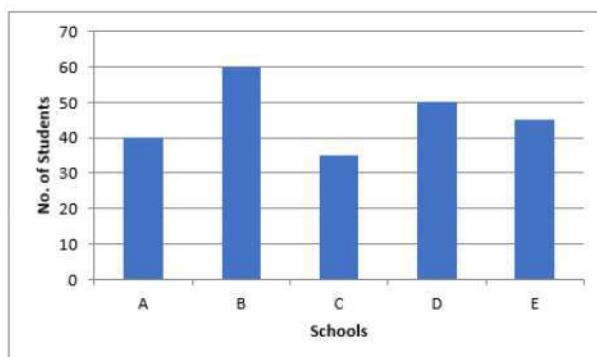
Q.16)- If $(w + \frac{1}{w}) = 6$, then what will be the value of $(w - \frac{1}{w})$?

1. $3\sqrt{2}$ 2. $\sqrt{2}$ 3. $2\sqrt{2}$ 4. $4\sqrt{2}$

Q.17)- The successive discounts of 15% and 20% is equivalent to a single discount of:

1. 35% 2. 32% 3. 25% 4. 28%

The Graph shows the number of students (in thousand) admitted to five schools.



The ratio between the total number of students admitted in schools B and D to the total number of students admitted in schools A,C and E is:

- Q.18)-** **1. 11 : 12 2. 11 : 10 3. 12 : 11 4. 10 : 11**

Supriya made a profit of 8% by selling a t-shirt after offering a discount of 10%. If the marked price of the t-shirt is ₹1,080, then find its cost price (in ₹) for Supriya.

- Q.19)-** **1. 880 2. 900 3. 920 4. 940**

If the length and breadth of a cuboid are increased by 7% and 6%, respectively, then the percentage increase in its volume is:

- Q.20)-** **1. 11.20% 2. 13.42% 3. 18.12% 4. 15.25%**

Data given in the table shows the number of boys and girls enrolled for different games in an academy over 5 years.

Years	Basketball		Football		Cricket	
	Boys	Girls	Boys	Girls	Boys	Girls
2018	46	34	42	37	45	35
2019	40	41	44	34	42	32
2020	43	40	40	32	38	36
2021	37	44	43	25	34	28
2022	34	41	41	32	41	39

With respect to football, in which year was the highest difference in the enrolment of boys and girls observed according to the given table?

- Q.21)-** **1. 2021 2. 2018 3. 2019 4. 2022**

Q.22)- Find the length of a tangent drawn to a circle with a radius of 6 cm, from a point 10 cm from the centre of the circle.

- Q.23)-** **1. 9 cm 2. 8 cm 3. 10 cm 4. 12 cm**

Aditya can complete a work of grill painting in 20 hours while Vinay can complete the same work in 15 hours. In how many hours will the entire work of grill painting be completed if both Aditya and Vinay work simultaneously?

- Q.24)-** **1. $8\frac{4}{7}$ 2. 12 3. $10\frac{2}{3}$ 4. 10**

Simplify the expression:

$$\frac{3 - \sin^2 A + \cos^2 A}{2 + 2 \cos^2 A}$$

Q.25)- The third proportion of 1.8 and 9 is:

1. 35 2. 45 3. 7.5 4. 81

Answer key

Q.1	1	Q.2	1	Q.3	2	Q.4	1	Q.5	3
Q.6	1	Q.7	1	Q.8	1	Q.9	2	Q.10	4
Q.11	4	Q.12	3	Q.13	4	Q.14	2	Q.15	1
Q.16	4	Q.17	2	Q.18	1	Q.19	2	Q.20	2
Q.21	1	Q.22	2	Q.23	1	Q.24	2	Q.25	2

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04/08/2023-> (11:45 AM - 12:45 PM)

PS and PT are two tangents from a point P outside the circle with centre O. If S and T are points on the circle such that $\angle SPT = 130^\circ$, then the degree measure of $\angle OST$ is equal to:

1. 65° 2. 35° 3. 25° 4. 55°

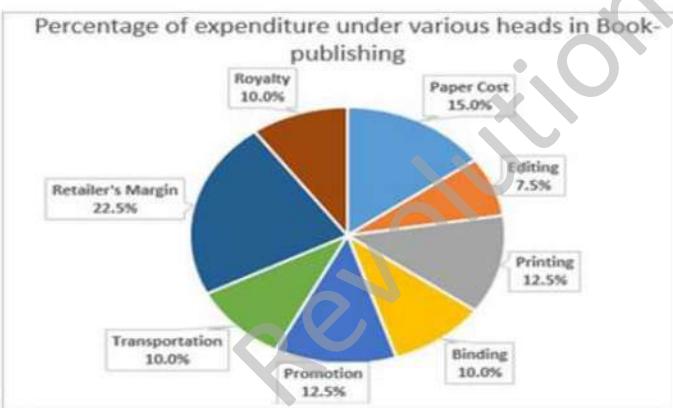
Q.2)- If $\tan \theta - \cot \theta = 4$, then find the value of $\tan^2 \theta + \cot^2 \theta$.

1. 16 2. 14 3. 20 4. 18

If 7 people working 4 hours a day can complete a task in 14 days. The number of days taken by 12 people working 8 hours a day will be:

1. $5\frac{1}{8}$ days 2. $4\frac{1}{12}$ days 3. $7\frac{1}{4}$ days 4. 8 days

The pie chart below gives the expenses under different heads that a publisher of books has to incur towards the cost of selling a book. All figures are given as percentages of the total expenditure incurred. If the retailer's margin is ₹3,55,500, which of the options given below provides correct information?



Q.4)-

1. The sum of the cost incurred towards payment of royalty and the cost of editing is ₹2,76,500. 2.

The sum of the cost of printing and the cost of editing is ₹3,15,000. 3. The difference between the retailer's margin and the cost of editing is ₹2,33,050.

4.

The difference between the cost of promotion and the cost of editing is ₹80,500.

Q.5)- Prakash spends 27% of his salary on children's education and donates 4% to a trust in a particular month. He spends ₹3,038 on these two heads, then his total salary for that month is:

1. ₹11,251 2. ₹9,800 3. ₹4,402 4. ₹13,200

Q.6)- A merchant advertise 10% off on the items bought from his store. Find the discount got by a customer who bought a bag worth ₹560, an exercise book worth ₹90 and a pen worth ₹45.

1. ₹69.50 2. ₹59 3. ₹65 4. ₹67.50

Q.7)- A triangle PQR has three sides equal in measurement and if PM is perpendicular to QR, then which of following equality holds?

1. $3PQ^2 = 4PM^2$ **2.** $3PQ^2 = 2PM^2$ **3.** $3PM^2 = 2PQ^2$ **4.** $3PM^2 = 4PQ^2$

Q.8)- The sides of the three cubes of metal are 15 cm, 18 cm and 25 cm, respectively. Find the side (in cm) of the new cube formed by melting these cubes together.

1. $9\sqrt[3]{388}$ **2.** $6\sqrt[3]{388}$ **3.** $4\sqrt[3]{388}$ **4.** $7\sqrt[3]{388}$

Q.9)- If $x + \frac{2}{x} = 1$, then the value of $\frac{x^2+7x+2}{x^2+13x+2}$ is:

1. $\frac{3}{7}$ **2.** $\frac{5}{7}$ **3.** $\frac{2}{7}$ **4.** $\frac{4}{7}$

Q.10)- If $A = 30^\circ$, then find the value of $\frac{(2 \tan A)}{(1 - \tan^2 A)}$.

1. $2\sqrt{3}$ **2.** $\frac{3}{\sqrt{3}}$ **3.** 3 **4.** $4\sqrt{3}$

If a map of a city was drawn on a scale of 0.2 cm to a km, what area would represent a country if it has an area of 22500 km²?

Q.11)-

1. 5625km² **2.** 2500km² **3.** 900km² **4.** 2250 km²

Q.12)- Which of the following is an identity?

1. $(a-b)^2 = a^2 - b^2 - 2ab$ **2.** $(a+b)^2 = a^2 + b^2 + 2ab$ **3.** $(a-b)^2 = a^2 - b^2$ **4.** $(a+b)^2 = a^2 + b^2$

Q.13)- A shopkeeper professes to sell sugar costing ₹40/kg at ₹42/kg but gives only 550 grams sugar in place of 600 grams using faulty weighing machine. His profit percentage (correct to 2 decimal places) is:

1. 16.45% **2.** 15.45% **3.** 14.54% **4.** 15.54%

The number of various types of vehicles (in thousands) in three cities are given below.

City → Vehicle ↓	B	C	K
Car	4.5	3.0	3.0
Bus	2.5	3.0	4.5
Truck	3.4	3.5	3.5
Bike	3.2	3.3	3.4

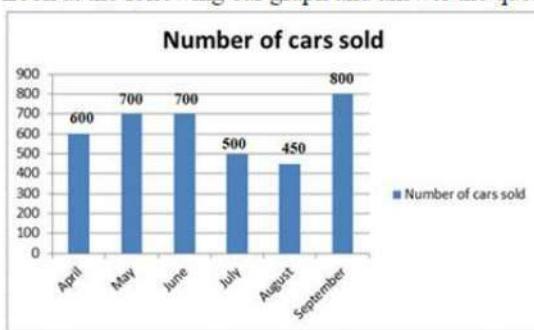
Q.14)- Which type of vehicle is the maximum in number combining the three cities?

1. Car **2.** Truck **3.** Bus **4.** Bike

Q.15)- If $(2^2 + 4)^2 \times (3 - 5) + 20\% \text{ of } 400 + x\% \text{ of } 30 = 30\% \text{ of } 30$, find the value of x.

1. 120 **2.** 160 **3.** 190 **4.** 150

Bar Graph showing number of cars sold by a reputed company during different months of a year.
Look at the following bar graph and answer the question that follows:



Q.16)- In which month was the sale highest and was what per cent of the total sale of 6 months?

1. May 18.7% nearly 2. July 21.3% nearly 3. September 18.7% nearly 4. September 21.3% nearly

Anam and Bikash invest in a business in the ratio 3 : 2. If in a particular month, Anam gets ₹3,840 as profit, the total profit is:

1. ₹6,300 2. ₹6,400 3. ₹5,800 4. ₹6,550

Q.18)- If the angle between two radii of a circle is 100° , then the angle between the tangents at the ends of the radii will be:

1. 90° 2. 80° 3. 70° 4. 50°

Q.19)- In a rhombus STUV, S and U are joined $\angle SUV = 44^\circ$, $\angle STU = 92^\circ$, what is the degree measure of $4\angle SVU - 3\angle TSU$?

1. 451° 2. 360° 3. 169° 4. 236°

Q.20)- What is the compound interest on ₹25,000 for 3 years at 10% per annum compounded yearly?

1. ₹8,200 2. ₹8,275 3. ₹8,125 4. ₹8,000

Q.21)- If $\sqrt{\frac{a}{b}} = \frac{8}{3} - \sqrt{\frac{b}{a}}$ and $a - b = 10$, then the value of ab is:

1. $32\frac{4}{7}$ 2. $32\frac{1}{7}$ 3. $32\frac{2}{7}$ 4. $32\frac{3}{7}$

Etika purchased a set of wallpapers for ₹700 and the marked price of a set was ₹850. The approximate rate of discount was:

1. 22.5% 2. 25.34% 3. 17.64% 4. 12.65%

A retailer buys 50 pens at the marked price of 44 pens. If he sells these pens at a discount of 1% on the marked price, what is the profit per cent?

1. 12% 2. 15% 3. 12.5% 4. 10%

Q.24)- If $\tan \theta = \frac{4}{5}$, then $\sec \theta$ is:

1. $\frac{\sqrt{41}}{4}$ 2. $\frac{\sqrt{41}}{20}$ 3. $\frac{5}{4}$ 4. $\frac{\sqrt{41}}{5}$

If a train 130 m long takes $6\frac{1}{2}$ seconds to cross a man who is walking at 12 km/h in the same direction in which the train going, then the speed of the train (in km/h) is:

1. 74 2. 48 3. 84 4. 64

Answer key

Q.1	1	Q.2	4	Q.3	2	Q.4	1	Q.5	2
Q.6	1	Q.7	1	Q.8	3	Q.9	4	Q.10	2
Q.11	3	Q.12	2	Q.13	3	Q.14	1	Q.15	3
Q.16	4	Q.17	2	Q.18	2	Q.19	4	Q.20	2
Q.21	2	Q.22	3	Q.23	3	Q.24	4	Q.25	3

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04/08/2023-> (2:30 PM - 3:30 PM)

The table shows the number of cars rejected and the percentage of those accepted by quality control department, out of the total number of cars assembled by four machines A, B, C and D.

Machine	Number of Cars rejected	Percentage of acceptance of cars
A	840	86
B	600	90
C	550	90
D	1000	80

Q.1)- How many cars assembled by machine C were accepted?

1. 5400 2. 7560 3. 4950 4. 5160

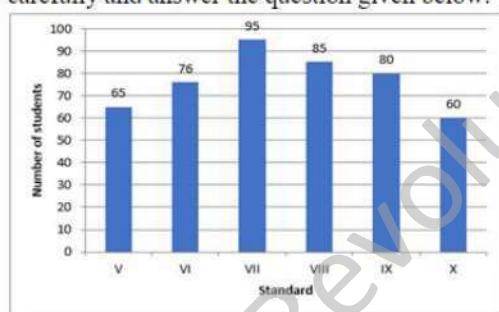
Q.2)- Find the value of $(a^3 + b^3 + c^3 - 3abc)$, where $a = 335$, $b = 215$ and $c = 180$.

1. 14472250 2. 15421320 3. 14502230 4. 15452630

Q.3)- 15 boys can complete a task in 28 days. In how many days can 21 boys complete the same task?

1. 20 2. 18 3. 21 4. 24

The following bar graph represents the total number of students in different standards in a school. Study the graph carefully and answer the question given below:



Q.4)- The number of students in Xth standard is what per cent less than the number of students in VIIth standard? (correct up to two decimal places).

1. 36.84% 2. 58.33% 3. 28.33% 4. 46.84%

Q.5)- PQ is a chord of a circle. The tangent XR at X on the circle cuts PQ produced at R. If $XR = 12$ cm, $PQ = x$ cm, $QR = x - 2$ cm, then x (in cm) is:

1. 7 2. 6 3. 10 4. 14

Q.6)- A person walked from his house to a supermarket at the rate of 10 kmph and walked back at the rate of 5 kmph. For the whole journey, he took 1 hour 30 minutes. Find the distance from his house to the supermarket (in km).

1. 10 2. 5 3. 6 4. 8

Q.7)- Ashok invested ₹18,000 for 3 years at 5% compound interest in a post office. If the interest is compounded once in a year, what sum will he get after 3 years?

1. ₹22,961.50 2. ₹20,837.25 3. ₹22,6291.75 4. ₹21,926.00

If Aashima travels a certain distance with a speed of 80 km/h in 5 hours. Then how many hours (rounded off to 1 decimal point) approximately will she take to cover the same distance with a speed of 150 km/h?

Q.8)-

1. 2.7 hours 2. 8.3 hours 3. 3 hours 4. 3.5 hours

MN is the diameter of a circle with centre O. P and S are two points on the circumference of the circle on either side of MN, such that $\angle PMN = 50^\circ$ and $\angle MNS = 35^\circ$. What is the degree measure of the difference of $\angle PMS$ and

Q.9)-

1. 25° 2. 55° 3. 65° 4. 30°

Q.10)- If $(x + \frac{1}{x}) = 7$ and $x > 1$, what is the value of $(x^3 - \frac{1}{x^3})$?

1. $174\sqrt{5}$ 2. $164\sqrt{5}$ 3. $154\sqrt{5}$ 4. $144\sqrt{5}$

Q.11)- What is the value of x, if $3 : 8 :: x : 12$?

1. 9 2. $\frac{5}{2}$ 3. 5 4. $\frac{9}{2}$

The distance between the centres of two circles having radii of 24 cm and 18 cm, respectively, is 48 cm. Find the length

Q.12)- (in cm) of a/an transverse/indirect common tangent to the two circles.

1. $16\sqrt{2}$ 2. $18\sqrt{2}$ 3. $6\sqrt{15}$ 4. $10\sqrt{5}$

A shopkeeper usually makes one big besan laddoo (spherical in shape) with a radius of 9 cm. With the same laddoo,

how many besan laddoos of radius 3 cm can be made? (Use $\pi = \frac{22}{7}$)

Q.13)-

1. 9 2. 18 3. 36 4. 27

Q.14)- $\Delta ABC \sim \Delta PQR$, $AB = 12$ cm, $PQ = 18$ cm and the perimeter of ΔABC is 45 cm. Find the perimeter of ΔPQR .

1. 60 cm 2. 30 cm 3. 67.5 cm 4. 70 cm

The average weight of a group of 12 children is 66 kg. If 2 children, X and Y, replace A and B, the new average weight becomes 65 kg. The weight of A = weight of B and the weight of X = weight of Y. Another child, C, is included in the

Q.15)- group, and the new average weight remains 65 kg. Weight of C = weight of X. Find the weight of A.

1. 69 kg 2. 72 kg 3. 71 kg 4. 67 kg

A candidate who gets 20% of the marks in an examination fails by 30 marks. But another candidate who gets 32%

Q.16)- marks, gets 42 marks more than necessary for passing. Find the maximum number of marks.

1. 500 2. 700 3. 400 4. 600

The simple interest on ₹986 for a certain period of time is less than the simple interest on ₹1,296 for the same period of time at the rate of 5% simple interest by ₹62. For how many years was each sum of money invested?

1. 6 2. 3 3. 5 4. 4

When a number is divided by 7, leaves 1 as the remainder. When the cube of this number is divided by 7, what will be the remainder?

1. 4 2. 2 3. 3 4. 1

Q.19)- If $(y - \frac{1}{y}) = 9$, find the value of $(y^3 - \frac{1}{y^3})$.

1. 766 2. 756 3. 702 4. 729

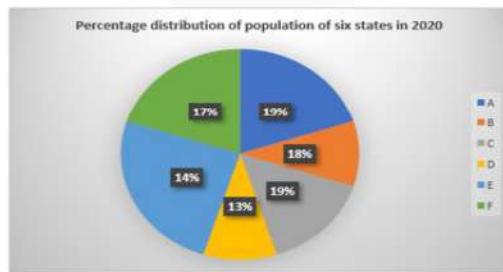
If the cost price of a book is 92% of its selling price, then what is the percentage profit on the sale of the book (correct up to two decimal places)?

1. 8.25% 2. 8.69% 3. 8.00% 4. 8.53%

Q.21)- If $\sec \theta + \tan \theta = \sqrt{3}$, then the positive value of $\sin \theta + \cos \theta$ is:

1. $\frac{(1+\sqrt{3})}{2}$ 2. $\frac{2}{\sqrt{3}}$ 3. $\frac{\sqrt{3}}{2}$ 4. $\frac{2}{(1+\sqrt{3})}$

In the given pie chart, the percentage distribution of the population of six states in 2020 is given. Study the pie chart and answer the question that follows.



The percentage of population employed in government jobs is given in the following table.

State	Percentage of population doing government jobs
A	42
B	32
C	12
D	30
E	28
F	35

Q.22)- What is the ratio of the population doing government jobs in state E to the population doing government jobs in state A?

1. 23 : 96 2. 13 : 37 3. 28 : 57 4. 29 : 39

Q.23)- A dealer gives a 7% discount on the marked price and gives 1 article free for buying every 25 articles and thus gains 25%. Find the percentage increase in the marked price above the cost price (round up to two decimal places).

1. 39.78% 2. 37.88% 3. 1.4% 4. 38.87%

Q.24)- Evaluate: $8 \sec^2 45^\circ + 20 \sin^2 30^\circ + 15 \tan 45^\circ$

1. 43 2. 28 3. 36 4. 32

Q.25)- Let ABC be a triangle right-angled at B. If $\angle C = 60^\circ$ and $AB = 3$ cm, then find the lengths of BC and AC, respectively.

1. $\sqrt{3}$ cm, $2\sqrt{3}$ cm 2. 9 cm, $4\sqrt{3}$ cm 3. 3 cm, $2\sqrt{3}$ cm 4. $\sqrt{3}$ cm, $4\sqrt{3}$ cm

Q.1	3	Q.2	1	Q.3	1	Q.4	1	Q.5	3
Q.6	2	Q.7	2	Q.8	1	Q.9	4	Q.10	4
Q.11	4	Q.12	3	Q.13	4	Q.14	3	Q.15	3
Q.16	4	Q.17	4	Q.18	4	Q.19	2	Q.20	2
Q.21	1	Q.22	3	Q.23	1	Q.24	3	Q.25	1



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04/08/2023-> (5:15 PM - 6:15 PM)

The marked price of a toy car is ₹600. The shopkeeper gives a discount of 4% and still makes a profit of 28%. Find the cost price.

- Q.1)-
1. ₹480 2. ₹420 3. ₹460 4. ₹450

Simplify the following expression.

$$\frac{(a^2 + b^2 - c^2)^2 - (a^2 - b^2 + c^2)^2}{b^2 - c^2}$$

Q.2)-

1. $5a^2$ 2. $2a^2$ 3. $3a^2$ 4. $4a^2$

A certain sum was invested at the rate of 10% for a period of 2 years at compound interest and compounded annually. The same sum was invested for the same period and same rate of interest at simple interest. If the difference of compound interest and simple interest was ₹200, find the sum.

- Q.3)-
1. ₹22,000 2. ₹20,000 3. ₹25,000 4. ₹30,000

The average age of 30 students in a class is 12 years. The average age of a group of 5 of the students is 10 years and that of another group of 5 of them is 14 years. The average of the remaining students is:

- Q.4)-
1. 13 years 2. 14 years 3. 12 years 4. 11 years

Q.5)- What will be the perimeter (in cm) of the sector of a circle of radius 4.9 cm having central angle 144° (use $\pi = \frac{22}{7}$)?

1. 21.12 2. 22.12 3. 23.23 4. 23.32

The number of students in three different streams in different colleges are given below.

College ↓	Stream →	Science	Arts	Commerce
1		1550	1900	2200
2		1800	1700	2400
3		1650	1850	2250
4		1700	1250	3250

Q.6)- The difference between the average number of students per college in commerce and the average number of students per stream in college 2 (Correct to 2 decimal places) is:

1. 819.67 2. 891.67 3. 558.33 4. 981.67

Q.7)- What is the least value of x for which the number $712x816$ is divisible by 12?

1. 1 2. 0 3. 2 4. 4

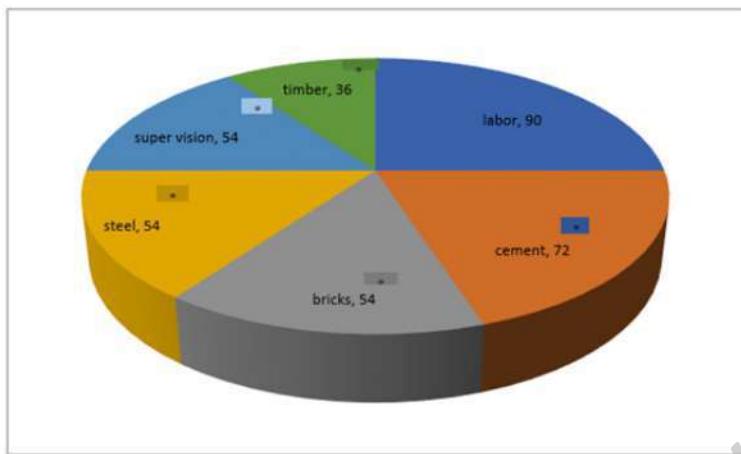
The sides of similar triangle $\triangle ABC$ and $\triangle DEF$ are in the ratio of $\frac{\sqrt{3}}{\sqrt{5}}$. If the area of $\triangle ABC$ is 90 cm^2 , then the area of $\triangle DEF$ (in cm^2) is::

- Q.8)-** 1. 156 2. 150 3. 152 4. 154

Q.9)- If $2x + 3y = 4$ and $4x^2 + 9y^2 = 64$, then what is the value of $8x^3 + 27y^3$.

1. 352 2. 325 3. 235 4. 253

The pie chart shows the cost of construction of a house in degree.



Q.10)- What is the average expenditure on timber, super vision and cement?

1. 15% 2. 21% 3. 20% 4. 10%

Q.11)- A dealer gives 10%, 20% and 30% successive discounts on an item. What is the single equivalent discount on the item?

1. 54.8% 2. 47.6% 3. 49.6% 4. 52.8%

If $\sin(A - B) = \frac{1}{2}$, and $\sin(A + B) = 1$, where A and B are positive acute angles and $A \geq B$, then A and B are respectively:

1. $60^\circ, 30^\circ$ 2. $70^\circ, 20^\circ$ 3. $80^\circ, 10^\circ$ 4. $50^\circ, 40^\circ$

Simplify:

Q.13)-
$$\frac{(612+388)^2+(612-388)^2}{(612 \times 612)+(388 \times 388)} = ?$$

1. 4 2. 2 3. 3 4. 1

Sukhen purchased some perishable items for sale but 15% of those items could not be sold and went bad. However, Sukhen managed to sell the rest of the items at a price that helped him earn an overall profit of 19%. At what percentage above the cost price of each item did Sukhen sell each of the items that did NOT go bad?

1. 42% 2. 36% 3. 34% 4. 40%

The following table gives the number of students who went abroad during 1994-1998.

Year/State	1994	1995	1996	1997	1998
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
Karnataka	750	600	830	575	900
West Bengal	500	550	450	600	525
Delhi	1500	1625	1700	1475	1800
Andhra Pradesh	800	840	875	925	785
Total	5308	5395	5955	5895	6435

Q.15)- From which state/U.T. did the least number of students go abroad over the years among the given States/U.T.s?

1. Kerala 2. Karnataka 3. Maharashtra 4. West Bengal

The area of a triangle is half the area of a square. The perimeter of the square is 172 cm. What is the area of the

Q.16)- triangle (in cm^2)?

1. 1849 2. 924.5 3. 992 4. 1984

Q.17)- If $a = \cot A + \cos A$ and $b = \cot A - \cos A$, then find the value of $a^2 - b^2 - 4\sqrt{ab}$.

1. 0 2. 1 3. -1 4. -4

A boat takes 11 hours to travel a distance upstream and takes 5 hours to travel the same distance downstream. If the

Q.18)- speed of the boat in still water is $2\frac{2}{9}$ m/sec, then the speed of the stream (in km/h) is:

1. 3 2. 2 3. 1 4. 4

Q.19)- If $2\tan^2 A + 4\cos^4 A = 3$, then the possible value of A is:

1. 45° 2. 60° 3. 0° 4. 30°

The radius of a circle is 21 cm. What will be the length (in cm) of an arc of the circle that subtends a 22.5° angle at the

Q.20)- centre? [Use $\pi = \frac{22}{7}$]

1. 8.25 2. 7.50 3. 7.75 4. 8.50

A can do a piece of work in 24 days and B can do the same work in 30 days. If they work on it together for 8 days,

Q.21)- then the fraction of the work that is left is:

1. $\frac{2}{3}$ 2. $\frac{1}{3}$ 3. $\frac{2}{5}$ 4. $\frac{3}{5}$

A man invested ₹25,400 on simple interest for 9 years to obtain a total amount of ₹67,790 on a certain annual rate of

Q.22)- interest. What was the rate of interest (rounded off to 2 decimal places) to obtain the above amount?

1. 18.45% 2. 18.54% 3. 15.84% 4. 14.58%

Q.23)- How many litres of water can a hemispherical tank of radius 2.1 m contain? (Take $\pi = \frac{22}{7}$)

1. 19324 2. 18984 3. 19404 4. 18404

Q.24)- Third proportion of 15 and 120 is:

1. 880 2. 900 3. -860 4. 960

A man spent 30% of his monthly income on rent. He spent 15% of the remaining amount on food. 35% of the amount now left was used for all other expenses. If ₹1,62,435 was left with him, then his monthly income was:

Q.25)- 1. ₹5,40,000 2. ₹4,80,000 3. ₹4,20,000 4. ₹3,60,000

Answer key

Q.1	4	Q.2	4	Q.3	2	Q.4	3	Q.5	2
Q.6	3	Q.7	3	Q.8	2	Q.9	1	Q.10	1
Q.11	3	Q.12	1	Q.13	2	Q.14	4	Q.15	4
Q.16	2	Q.17	1	Q.18	1	Q.19	1	Q.20	1
Q.21	3	Q.22	2	Q.23	3	Q.24	4	Q.25	3

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(Selected as GST Inspector)
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07/08/2023-> (9:00 AM - 10:00 AM)

Q.1)- If the angles P, Q and R of $\triangle PQR$ satisfy the relation $2R - P = Q - R$, then find the measure of $\angle R$.

1. 50°
2. 60°
3. 55°
4. 45°

Q.2)- One angle of an isosceles obtuse triangle is $28\frac{1}{2}^\circ$. Find the measure of its obtuse angle in degrees.

1. 123°
2. 112°
3. 121°
4. 132°

Ravi borrowed some money at the rate of 5% per annum for the first three years, 8% per annum for the next two years, and 10% per annum for the period beyond 5 years. If he paid a total simple interest of ₹12,750 at the end of 7 years,

Q.3)- then how much money did he borrow?

1. ₹26,000
2. ₹24,000
3. ₹25,000
4. ₹27,000

Study the given table and answer the question that follows.

The table indicates the number of products sold by four different companies.

Products	Companies			
	A	B	C	D
Top quality	330	230	221	230
Medium quality	340	345	450	320
Low quality	488	550	580	220

Q.4)- Which company produces the maximum low-quality products?

1. C
2. A
3. B
4. D

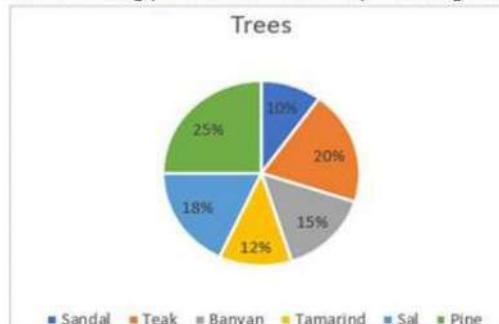
Q.5)- The value of $2\frac{3}{5} \div \left[2\frac{1}{3} \div \left\{ 4\frac{1}{3} - \left(2\frac{1}{2} + \frac{2}{3} \right) \right\} \right]$ is equal to:

1. $2\frac{7}{10}$
2. $1\frac{3}{10}$
3. $2\frac{3}{7}$
4. $1\frac{3}{7}$

On parallel tracks, two trains of equal length are moving at speeds of 46 and 36 kilometres per hour in the same direction. In 36 seconds, the quicker train overtakes the slower one. The length of each train is:

1. 56 metre
2. 52 metre
3. 60 metre
4. 50 metre

The following pie chart shows the percentage distribution of trees in a forest.



Q.7)- If the forest has 7500 pine trees, then find how many trees are there in the forest?

1. 7,500
2. 30,000
3. 27,000
4. 22,500

The marked price of a cooler is ₹800. It is sold at a discount of 10%. Due to the festival season, the shopkeeper allowed a further discount of 5%. Find the selling price of the cooler.

Q.8)- A tradesman marks his goods at such a price that after allowing a discount of 31%, he makes a profit of 15%. What is the marked price of an article whose cost price is ₹3,420?

1. ₹688
2. ₹678
3. ₹684
4. ₹672

Q.9)- A tradesman marks his goods at such a price that after allowing a discount of 31%, he makes a profit of 15%. What is the marked price of an article whose cost price is ₹3,420?

1. ₹5,475
2. ₹5,200
3. ₹5,550
4. ₹5,700

Q.10)- What will be the present value of ₹13,230 due two years hence, when the interest is compounded at the rate of 5% per annum?

1. ₹10,500
2. ₹12,000
3. ₹13,000
4. ₹11,500

Q.11)- In $\triangle ABC$ and $\triangle PQR$, $\angle B = \angle Q$, $\angle C = \angle R$ and $AB = 2PQ$, then the two triangles are _____.

1. congruent but not similar
2. congruent as well as similar
3. similar but not congruent
4. neither similar nor congruent

Q.12)- Find the value of $\cot^2 B - \operatorname{cosec}^2 B$ for $0 < B < 90^\circ$.

1. 2
2. -1
3. 1
4. -2

Q.13)- Aman decided to cover a distance of 12 km in 78 minutes. He decided to cover the initial two-thirds of the distance at 10 km/h and the remaining at some different speed. Find the speed for the last one-third of the distance.

1. 8 km/h
2. 9 km/h
3. 8.4 km/h
4. 7.8 km/h

Q.14)- A man invests ₹44,000 in some shares in the ratio 1 : 4 : 5 which pay dividends of 10%, 15% and 25% on his investment for one year, respectively. His total dividend income is:

1. ₹7,850
2. ₹7,970
3. ₹8,510
4. ₹8,580

The given expression is equal to:

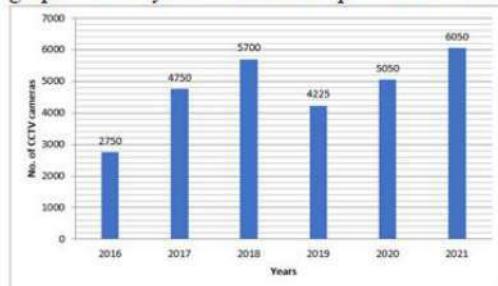
$$1 - \frac{\tan^2 \theta}{\sec^2 \theta}$$

Q.15)-

1. $\tan^2 \theta \cos^2 \theta$
2. $\sin^2 \theta \cos^2 \theta$
3. $\sin^2 \theta \cot^2 \theta$
4. $\cot^2 \theta \cos^2 \theta$

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The following bar graph represents the number of CCTV cameras manufactured by a company over six years. Study the graph carefully and answer the question that follows:



What is the ratio of the total number of CCTV cameras manufactured in the years 2016 and 2017 to the total number of CCTV cameras manufactured in the years 2020 and 2021?

- Q.16)- 1. 37 : 25 2. 25 : 39 3. 25 : 37 4. 39 : 25

Q.17)- If $x + \frac{1}{x} = 2$, then find the value of $x^{1823} + \frac{1}{x^{1929}}$

1. -1 2. 1 3. 2 4. 0

Find the distance (in cm) between the centres of two circles having radii of 32 cm and 24 cm, respectively, if the length of a direct common tangent to the two circles is given as $24\sqrt{7}$ cm.

- Q.18)- 1. 60 2. 63 3. 64 4. 65

Q.19)- If $a + b + c = 15$ and $ab + bc + ca = 22$, then find the value of $a^2 + b^2 + c^2$.

1. 181 2. 161 3. 141 4. 131

Simplify the following expression.

Q.20)- $\{(x - 5)(x - 1)\} - [(9x - 5)(9x - 1)] \div 16x$

1. $x(5x - 3)$ 2. $2x(5x - 3)$ 3. $-6x(5x - 3)$ 4. $-(5x - 3)$

An item is sold for ₹2,744, and the seller earns 12% profit. What should be the selling price (in ₹) to earn only 5% profit?

1. ₹2,275.50 2. ₹2,725.50 3. ₹2,572.50 4. ₹2,527.50

Q.22)- If $\alpha \sin 45^\circ = \beta \operatorname{cosec} 30^\circ$, then α^4/β^4 is:

1. 4^3 2. 4^4 3. 3^3 4. 2^3

The dome of a residential tower is in the form of a hemisphere with a radius of 560 cm. Find the cost of painting it at the rate of ₹25 per m^2 . (Take $\pi = \frac{22}{7}$)

1. ₹4,289 2. ₹4,298 3. ₹4,982 4. ₹4,928

Q.24)- Find 2 numbers such that their mean proportional is 25 and their third proportional is 25.

1. 5 and 25 2. 5 and 5 3. 25 and 125 4. 25 and 25

Q.25)- 4 men and 8 women complete a job in 10 days, and 5 men and 24 women complete the same work in 4 days. In how many days will 1 man and 1 woman complete the same work?

1. $63\frac{1}{3}$ days 2. $67\frac{1}{3}$ days 3. $62\frac{2}{9}$ days 4. $69\frac{7}{9}$ days

Answer key

Q.1	4	Q.2	1	Q.3	3	Q.4	1	Q.5	2
Q.6	4	Q.7	2	Q.8	3	Q.9	4	Q.10	2
Q.11	3	Q.12	2	Q.13	1	Q.14	4	Q.15	3
Q.16	3	Q.17	3	Q.18	3	Q.19	1	Q.20	4
Q.21	3	Q.22	1	Q.23	4	Q.24	4	Q.25	3

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The advertisement features a green background with a red banner at the top containing the text "SSC CGL-2023". Below this, a large yellow banner displays "Tier-2 Rs.149 Test Series". To the right, a portrait of a man with a beard, identified as Shubham Sir, is shown with his arms crossed. He is wearing a black polo shirt with the RBE logo. The RBE logo is also present in a circular emblem at the top right. At the bottom, it says "Based on Latest Pattern" and "20 Tier-2 Mocks". A red banner at the bottom right identifies him as "SHUBHAM SIR SSC CGL SELECTED".



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07/08/2023-> (11:45 AM - 12:45 PM)

Q.1)- The algebraic expression $2x^2 - 32$ is equal to ____.

1. $2(x+4)^2$ 2. $2(x+4)(x-4)$ 3. $(x+4)(x-4)$ 4. $2(x-4)^2$

Q.2)- If the radius of a circle is 8 cm, then find the length of its largest chord.

1. 4 cm 2. 8 cm 3. 64 cm 4. 16 cm

The table given below shows the number of television sets that were sold by the showrooms X, Y, Z, L, M, N from the year 2016 to 2019. Answer the question given below based on the information given in the table.

Years / Showroom	X	Y	Z	L	M	N
2016	234	167	179	176	187	273
2017	180	274	269	98	370	195
2018	130	151	236	176	239	277
2019	264	107	237	225	282	237

Q.3)- How many more television sets were sold by all the showrooms in the year 2017 as compared to 2019?

1. 34 2. 93 3. 67 4. 43

Q.4)- If $\left(x + \frac{1}{x}\right) = 5$, then the value of $\left(x^5 + \frac{1}{x^5}\right)$ is:

1. 2515 2. 2540 3. 2525 4. 2535

A solid rectangular block of metal of dimensions $88\text{ cm} \times 21\text{ cm} \times 21\text{ cm}$, is melted to form a solid sphere. What is its radius (in cm)?

Q.5)- Take $\pi = \frac{22}{7}$

1. 21 2. 14 3. 28 4. 35

In a square ABCD, E is a point inside the square such that $\triangle DEC$ is an equilateral triangle. If E is joined to vertices A and B of the square, what is the degree measure of $\angle AEB$?

1. 135° 2. 210° 3. 150° 4. 225°

A and B can finish a work in 6 days and 4 days, respectively. A alone worked on it for 2 days. Thereafter, B joined him. How much total time was taken by them to finish the work?

1. $4\frac{1}{5}$ days 2. $3\frac{3}{5}$ days 3. $3\frac{1}{5}$ days 4. $1\frac{3}{5}$ days

Q.8)- Akhilesh invested a certain sum which amounted to ₹82,000 in 2 years at 6% per annum compound interest, compounded annually. What was the sum invested (in ₹) by Akhilesh? (round off to the nearest integer)

1. 72,980 2. 73,980 3. 70,980 4. 72,680

What is the least number that must be added to the greatest 6-digit number so that the sum will be exactly divisible by

Q.9)- 294?

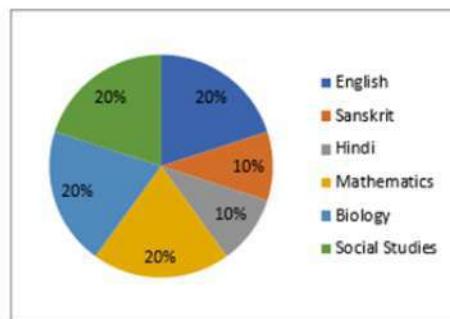
1. 194 2. 269 3. 234 4. 189

Q.10)- In ΔOPQ , right-angled at P, $OP = 7$ cm and $OQ - PQ = 1$ cm. Determine the values of $\sin Q + \cos Q$.

1. $\frac{33}{25}$ 2. $\frac{13}{25}$ 3. $\frac{31}{25}$ 4. $\frac{21}{25}$

Study the given pie-chart and answer the question that follows.

Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male and female teachers is 3 : 1.



Q.11)- Find the ratio of teachers in Sanskrit and Hindi to teachers in Mathematics and Biology.

1. 1 : 3 2. 2 : 1 3. 3 : 1 4. 1 : 2

Q.12)- If $(x - \frac{1}{x}) = 0.4$, and $x > 0$, what is the value of $(x^2 + \frac{1}{x^2})$?

1. 3.32 2. 2.16 3. 1.84 4. 4.16

Q.13)- Find the value of $\sin 60^\circ \sec 30^\circ + \tan 45^\circ \cos 0^\circ + \sec 60^\circ \sin 30^\circ$.

1. 3 2. 0 3. 1 4. 2

Q.14)- If $\sin \theta \cdot \sin 45^\circ = \sin 30^\circ$ and θ is an acute angle, then 2θ is equal to:

1. 90° 2. 30° 3. 45° 4. 0°

Q.15)- The present age of a father is twice that of his son. 8.5 years hence the ratio would be 7 : 4. Find the son's present age.

1. 25.5 years 2. 24.6 years 3. 16.5 years 4. 20.5 years

A jar contains 35% syrup in the mixture of syrup and water. A part of this mixture is replaced by another mixture containing 20% syrup. Now, in the new mixture, the percentage of syrup is found to be 24%. What is the ratio in which

Q.16)- these mixtures were mixed to obtain the new mixture?

1. 5 : 13 2. 4 : 11 3. 7 : 10 4. 3 : 14

Rumi used to save 20% of her income. If her income went up by 30%, while her expenditure went up by 40%, her

Q.17)- nominal savings went down by ₹750. Find Rumi's initial income (in ₹).

1. 38,500 2. 36,000 3. 37,500 4. 35,000

The radius of a circle is 21 cm. What will be the area (in cm^2) of a sector of the circle that subtends a 22.5° angle at the centre? [Use $\pi = \frac{22}{7}$]

- Q.18)-** 1. 86.6250 2. 86.6025 3. 86.6205 4. 86.0625

The table shows the annual income of 5 schools in thousands:

Source of income	Schools				
	P	Q	R	S	T
Tuition fee	120	60	210	90	120
Activity fee	24	12	45	24	30
Grants	54	21	60	51	60

Q.19)- In how many schools is the tuition fee less than four times the activity fee?

1. 4 2. 2 3. 3 4. 1

Q.20)- What is the length (in cm) of the chord of a circle whose radius is 13 cm and whose perpendicular distance from the chord to the centre is 5 cm?

1. 12 2. 30 3. 18 4. 24

A shopkeeper offers the following discount schemes for the purchase of his goods. Find the scheme which has the maximum discount.

- (i) Two successive discounts of 20% and 10%
- (ii) Discount of 10%
- (iii) Buy 8 and get 4 free

Q.21)- (iv) Buy 9 and get 6 free

1. (ii) 2. (i) 3. (iv) 4. (iii)

Q.22)- For what positive value of k, the equation $3x^2 + 2kx + 3 = 0$ has real and equal roots?

1. 9 2. 12 3. 3 4. 1

Q.23)- The selling price of 34 articles is equal to the cost price of 38 articles. What is the gain percentage?

1. $11\frac{13}{17}\%$ 2. $7\frac{6}{17}\%$ 3. $9\frac{8}{17}\%$ 4. $10\frac{3}{17}\%$

Q.24)- A shopkeeper named Ramesh marks his articles at such a price that, even after allowing a discount of 20% on the marked price, he earns a profit of 15%. What is the marked price of one article, which costs ₹5,600?

1. ₹7,950 2. ₹10,550 3. ₹9,000 4. ₹8,050

Q.25)- A train running at 26.5 km/h takes 18 s to pass a platform. Next, it takes 12 s to pass a man walking at 5 km/h in the opposite direction. Find the length of the platform.

1. 10.0 m 2. 12.5 m 3. 22.5 m 4. 27.5 m

Answer key

Q.1	2	Q.2	4	Q.3	1	Q.4	3	Q.5	1
Q.6	3	Q.7	2	Q.8	1	Q.9	4	Q.10	3
Q.11	4	Q.12	2	Q.13	1	Q.14	1	Q.15	1
Q.16	2	Q.17	3	Q.18	1	Q.19	4	Q.20	4
Q.21	3	Q.22	3	Q.23	1	Q.24	4	Q.25	4

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07/08/2023-> (2:30 PM - 3:30 PM)

A sphere of diameter 18 cm has been melted to make cylinder of radius 3 cm and height 2 cm. The total number of Q.1)- cylinder made out will be:

- 1. 40
- 2. 100
- 3. 54
- 4. 45

Q.2)- If $\Delta ABC \cong \Delta PQR$, and $\angle C = 80^\circ$, $\angle A = 10^\circ$, then what will be the measure of $\angle Q$?

- 1. 80°
- 2. 30°
- 3. 100°
- 4. 90°

Q.3)- Simplify: $\frac{(1-m)^2 + (m-n)^2 + (n-l)^2}{12(1-m)(m-n)(n-l)} = ?$

- 1. $\frac{1}{2}$
- 2. $\frac{2}{3}$
- 3. $\frac{3}{2}$
- 4. $\frac{1}{4}$

The following bar graph shows the monthly profits of different six companies.



Q.4)- What is the ratio of the monthly profit of companies P to that of company U?

- 1. $3 : 2$
- 2. $5 : 2$
- 3. $2 : 5$
- 4. $2 : 3$

Rajender is working as a delivery boy in a multinational company. The company is paying him ₹90 per delivery. In a fortnight comprising 15 consecutive working days, his average earnings per day was ₹540. If his average earnings of the first 7 days was ₹519 per day and that of the last 7 days was ₹546 per day, then what was his earning on the 8th day of the fortnight?

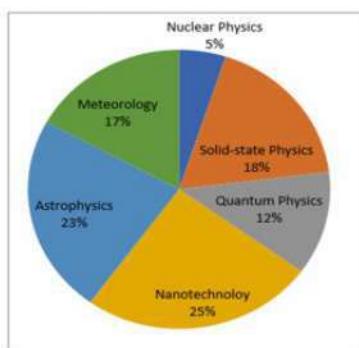
Q.5)-

- 1. ₹571
- 2. ₹681
- 3. ₹661
- 4. ₹645

Q.6)- If $x^2 + y^2 + z^2 = 628$ and $xy + yz + zx = 24$, then find the value of $(x + y + z)$.

- 1. 22
- 2. 28
- 3. 26
- 4. 24

The following pie chart represents the percentage-wise break up of research scholars in terms of their specialisation in Ph.D. in Physics. Total number of research scholars is 8000. Study the pie chart carefully and answer the question given below:



The number of research scholars having Meteorology as their specialisation is approximately (correct up to two decimal places) what per cent of the number of research scholars with Astrophysics specialisation?

Q.7)-

1. 72.41%
2. 71.91%
3. 70.41%
4. 73.91%

The given expression is equal to:

$$\frac{2 \sec A}{\sec^2 A - 1}$$

Q.8)-

1. $2 \operatorname{cosec} A \cot A$
2. $2 \cos A \cot A$
3. $2 \operatorname{cosec} A \tan A$
4. $2 \cos A \sin A$

The speed of a boat in standing water is 9 km/h and the speed of the stream is 1.5 km/h. A person rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is:

1. 24 hours
2. 22 hours
3. 21 hours
4. 23 hours

Kalyan invested a sum of ₹12,000 for two years compounded at 5% and 10%, respectively. What is the compound interest (in ₹) at the end of two years?

1. 1,880
2. 1,920
3. 1,900
4. 1,860

A person invested a certain amount at a rate of 12% simple interest and another amount at a rate of 10% simple interest. He received an annual interest of ₹130. However, if he had interchanged the amounts invested, he would have received ₹4 more as interest. How much did he invest at the rate of 12% simple interest originally?

1. ₹500
2. ₹650
3. ₹560
4. ₹600

The sum of the amount that Sunaina and Ranjan have is ₹23 and the difference of their amount is ₹7. The ratio of the amount that Sunaina and Ranjan have is:

1. 5 : 3
2. 7 : 15
3. 15 : 8
4. 2 : 17

A renowned brand marked its goods at 40% above the cost price but allows a discount of 7.5% for UPI payments to the customers. What actual profit is made on a shirt, if a customer pays ₹1,813 to buy it using UPI?

1. ₹413
2. ₹348
3. ₹378
4. ₹393

The marked price of a T-shirt is ₹560. The shopkeeper Krishna allows a discount of 16% and gains 12%. What would be the gain of Krishna if no discount is allowed?

1. $16\frac{2}{3}\%$ 2. $31\frac{1}{9}\%$ 3. $33\frac{1}{3}\%$ 4. $11\frac{1}{9}\%$

At one end of a diameter PQ of a circle of radius 8 cm a tangent APB is drawn to the circle. Find the length of the chord RS, which is parallel to AB and at a distance of 12 cm from P.

- Q.15)- 1. $6\sqrt{3}$ cm 2. $4\sqrt{3}$ cm 3. $2\sqrt{3}$ cm 4. $8\sqrt{3}$ cm

If the mathematical symbols in the expression given below are changed from ‘+’ to ‘+’, ‘–’ to ‘×’, ‘×’ to ‘–’, and ‘×’ to ‘+’, then what will be the value of the expression?

- Q.16)- $87 \times 256 + 16 - 77 + 1359$

1. 20 2. -40 3. 40 4. -20

The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The number in the brackets gives the maximum marks in each subject.

Students	Subject (Max. Marks)					
	Maths (150)	Chemistry (130)	Physics (120)	Geography (100)	History (60)	Computer Science (40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

If a student secures 80% or more in a subject, the student is considered to have received a distinction in the subject.

- Q.17)- What is the maximum number of subjects in which any single student has received a distinction?

1. 4 2. 6 3. 5 4. 3

The angle subtended at the centre of a circle by an arc of the circle measures 128.5° . Find the angle subtended at the circumference of the circle by the same arc.

- Q.18)- 1. 65.25° 2. 65.5° 3. 64.25° 4. 64.5°

The average age of 25 students in a class is 14 years. Five new students with an average age of 14.6 years join this class. What is the average age of 30 students in the class?

- Q.19)- 1. 13.1 years 2. 14.1 years 3. 15.1 years 4. 16.1 years

Find the distance (in cm) between the centres of two circles having radii of 40 cm and 30 cm, respectively, if the length of a transverse/indirect common tangent to the two circles is given as $10\sqrt{15}$ cm.

- Q.20)-

1. 75 2. 84 3. 72 4. 80

- Q.21)- The given expression is equal to: $\frac{\cos^2 A}{(1+\sin A)}$

1. $1 - \sin A$ 2. $1 + \cos A$ 3. $\sin A$ 4. $\cos A$

Q.22)- If $x + \frac{1}{x} = -1$, then the value of $x^{15} + \frac{1}{x^{15}}$ will be:

1. 3 2. 2 3. -1 4. 0

Q.23)- Two numbers are in the ratio of 1:2. If 7 is added to both, their ratio changes to 3:5. The greater number is:

1. 30 2. 18 3. 14 4. 28

A trader offers the following discount schemes for the purchase of his goods. Find the scheme which has the minimum discount.

(i) Two successive discounts of 12% each

(ii) Discount of 20%

(iii) Buy 5 and get 1 free

Q.24)- (iv) Buy 6 and get 2 free

1. (ii) 2. (iii) 3. (iv) 4. (i)

Q.25)- The value of $\sin^2 30 + \sin^2 40 + \sin^2 45 + \sin^2 55 + \sin^2 35 + \sin^2 45 + \sin^2 50 + \sin^2 60$ is:

1. 2 2. 4 3. 3 4. 1

Answer key

Q.1	3	Q.2	4	Q.3	4	Q.4	2	Q.5	4
Q.6	3	Q.7	4	Q.8	1	Q.9	1	Q.10	4
Q.11	1	Q.12	3	Q.13	1	Q.14	3	Q.15	4
Q.16	2	Q.17	1	Q.18	3	Q.19	2	Q.20	4
Q.21	1	Q.22	2	Q.23	4	Q.24	2	Q.25	2



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07/08/2023-> (5:15 PM - 6:15 PM)

A vertical pillar 42 cm long casts a 35 cm long shadow. At the same time, a tower casts a shadow 25 m long. Find the height of the tower.

- Q.1)-
1. 35 m 2. 32 m 3. 30 m 4. 28 m

In a division sum, the divisor is 11 times the quotient and 5 times the remainder. If the remainder is 44, then the dividend is:

- Q.2)-
1. 8444 2. 4448 3. 8888 4. 4444

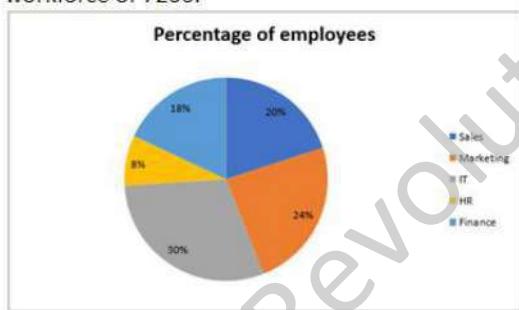
Q.3)- Simplify the following expression. $\frac{(0.96 \times 0.96 \times 0.96 + 0.04 \times 0.04 \times 0.04)}{(0.96 \times 0.96 - 0.96 \times 0.04 + 0.04 \times 0.04)}$

1. 1 2. 0.82 3. 0 4. 2

Q.4)- If TM and TN are the two tangents to a circle with centre O so that $\angle MON = 105^\circ$, then $\angle MTN$ will be equal to:

1. 70° 2. 75° 3. 60° 4. 85°

The pie chart given below shows the percentage of employees in various departments of a company having a total workforce of 7200.



Suppose the company plans to hire 324 more employees in the upcoming recruitment drive, of which 25% will be for the IT department, what would be the percentage increase in the number of employees in the IT department after the recruitment drive?

- Q.5)-
1. 9% 2. 12.5% 3. 5% 4. 3.75%

Harsha's expenditure is 45% of her income. If the income from the next month is increased by 15% and the amount she saved each month remains the same, then find the percentage increase in her expenditure (rounded off to 2 decimal places).

- Q.6)-
1. 33.33% 2. 45.00% 3. 15.00% 4. 27.50%

Q.7)- A toothpaste marked at ₹90 is sold for ₹78. The rate of discount is:

1. 13.33% 2. 14.22% 3. 12.13% 4. 15.23%

Q.8)- The difference between 24 and the mean proportional of 7 and 63 is:

1. 5 2. 3 3. 4 4. 2

Q.9)- If $\left(x - \frac{1}{x-2}\right) = 7$, then the value of $(x-2)^3 - \frac{1}{(x-2)^2}$ is:

1. 140 2. 125 3. 115 4. 130

If Sita and Gita can do a job together in 4 days and Sita alone can do the job in 6 days, in how many days can Gita do the job alone?

- Q.10)- 1. 10 2. 8 3. 12 4. 14

Q.11)- Simplify the given expression. $\frac{\sin^2 32^\circ + \sin^2 58^\circ}{\cos^2 32^\circ + \cos^2 58^\circ} + \sin^2 53^\circ + \cos 53^\circ \sin 37^\circ$

1. -1 2. 2 3. 1 4. -2

A person purchased ten boxes of grapes at a cost of ₹2,000 per box. Each box contained 20 kgs of grapes. He sold each box at the rate of ₹2,500 per box. But on the whole 10 kgs of grapes were damaged. Further he paid ₹1,000 as transport charges. Find his gain or loss.

- Q.12)- 1. Gain ₹2,050 2. Gain ₹2,750 3. Loss ₹1,000 4. Loss ₹1,500

If a sum of money becomes ₹6,000 in 3 years and ₹10,500 in 7 years and 6 months at the same rate of simple interest, then what is the rate of interest?

- Q.13)- 1. $33\frac{1}{3}\%$ 2. $66\frac{1}{3}\%$ 3. $25\frac{1}{2}\%$ 4. $45\frac{2}{3}\%$

Q.14)- The value of $\frac{\sin 58^\circ}{\cos 32^\circ} + \frac{\sin 55^\circ \sec 35^\circ}{\tan 5^\circ \tan 45^\circ \tan 85^\circ}$ is equal to:

1. 3 2. 1 3. 2 4. 0

Q.15)- The value of $\frac{1}{\sin \theta} - \frac{\cot^2 \theta}{1 + \operatorname{cosec} \theta}$ is:

1. 0 2. 2 3. 1 4. -1

Q.16)- A ship goes at 18 km/h downstream and at 16 km/h upstream. What will be the speed of the ship in still water?

1. 15 km/h 2. 14 km/h 3. 17 km/h 4. 16 km/h

Q.17)- Simplify the given expression. $\frac{x^3 + y^3 + z^3 - 3xyz}{(x-y)^2 + (y-z)^2 + (z-x)^2}$

1. $(x+y+z)$ 2. $\frac{1}{2}(x+y+z)$ 3. $\frac{1}{3}(x+y+z)$ 4. $\frac{1}{4}(x+y+z)$

Radha deposited ₹1,60,000 at a 10% rate of compound interest per annum for two years. If the interest is compounded semi-annually, then what is the compound interest (in ₹)?

- Q.18)- 1. 74,256 2. 16,400 3. 33,600 4. 34,481

The perpendicular distance from the centre of a circle to the chord is 20 cm. Calculate the chord's length in centimetres if the circle's diameter is 58 cm.

- Q.19)- 1. 28 2. 42 3. 56 4. 21

The diameter PQ of a circle with centre O is perpendicular to the chord RS. PQ intersects RS at T. If RS = 16 cm and QT = 4 cm, what is the length (in cm) of the diameter of the circle?

- 1. 24 2. 10 3. 20 4. 48**

A shopkeeper purchased an air conditioner for ₹24,000. He marks it for ₹30,000. He sells it to a customer at a

Q.21)- discounted price and still earns a profit of 9%. What is the rate of discount given by the shopkeeper to the customer?

- 1. 12.8% 2. 13.8% 3. 14.8% 4. 10.8%**

In two alloys, the ratio of Aluminium to Zinc are 5 : 6 and 3 : 5. If 242 kg of the first alloy and 144 kg of the second

Q.22)- alloy are mixed, then the ratio of Aluminium and Zinc in the new alloy will be:

- 1. 93 : 100 2. 82 : 111 3. 68 : 125 4. 76 : 117**

Refer to the given table and answer the following question:

Students	Weight (kg)	Height (m)
A	60	1.23
B	70	1.80
C	52	1.52
D	50	1.68
E	48	1.12

Q.23)- Which student has the least weight and least height among all?

- 1. E 2. C 3. B 4. D**

Table shows year wise productions of four crops (in tons) in a village during 2018-2019 to 2021-2022.

Crops Year	Pulses	Wheat	Rice	Others
2018-19	410	720	400	600
2019-20	380	680	350	580
2020-21	320	790	420	510
2021-22	250	690	270	490

Q.24)- The difference between the average production of wheat and the average production of pulses (in tons) over the year is:

- 1. 370 2. 360 3. 380 4. 350**

Find the volume of the largest right circular cone that can be cut out from a cube whose edge is $3\frac{1}{2}$ cm, correct to two

Q.25)- places of decimals (use $\pi = \frac{22}{7}$).

- 1. 21.31 cm³ 2. 12.13 cm³ 3. 11.23 cm³ 4. 13.21 cm³**

Answer key

Q.1	3	Q.2	4	Q.3	1	Q.4	2	Q.5	4
Q.6	1	Q.7	1	Q.8	2	Q.9	1	Q.10	3
Q.11	2	Q.12	2	Q.13	1	Q.14	3	Q.15	3
Q.16	3	Q.17	2	Q.18	4	Q.19	2	Q.20	3
Q.21	1	Q.22	2	Q.23	1	Q.24	3	Q.25	3



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08/08/2023-> (9:00 AM - 10:00 AM)

Q.1)- Find the value of $\frac{\cos^2 25^\circ - \sin^2 65^\circ}{\cos^2 25^\circ + \sin^2 65^\circ}$:

- 1. $\frac{1}{2}$
- 2. 1
- 3. 0
- 4. -1

Q.2)- If $x^2 - 11x + 1 = 0$, what is the value of $x^8 - 14159x^4 + 11$?

- 1. 11
- 2. 12
- 3. 10
- 4. 9

Q.3)- A cuboidal water tank is 12 m long, 9 m wide and 7.5 m deep. How many litres of water can it hold?

- 1. 840000
- 2. 810000
- 3. 805000
- 4. 780000

Q.4)- If $\sec \theta = 2 \frac{4}{23}$, find the value of $\tan^2 \theta$.

- 1. $3 \frac{177}{529}$
- 2. $2 \frac{16}{529}$
- 3. $1 \frac{200}{529}$
- 4. $3 \frac{384}{529}$

Q.5)- If $a + b + c = 16$, $ab + bc + ac = 81$, what is the value of $a^2 + b^2 + c^2$?

- 1. 89
- 2. 94
- 3. 98
- 4. 87

Q.6)- In triangle $\triangle MNO$, AB is parallel NO and $MA = 2.5$, $AN = 7.5$, $MB = 2.2$, find the value of BO.

- 1. 4.8
- 2. 5.4
- 3. 8.2
- 4. 6.6

Q.7)- In an isosceles triangle, if the unequal angle is five times the sum of the equal angles, then each equal angle is:

- 1. 60°
- 2. 30°
- 3. 45°
- 4. 15°

Q.8)- Half of the length of the chord of a circle is 12 cm and the perpendicular distance between the centre and the chord is 5 cm. The radius of the circle is:

- 1. 10 cm
- 2. 12 cm
- 3. 13 cm
- 4. 24 cm

Q.9)- The value of $\frac{\cos 65^\circ}{\sin 25^\circ} + \frac{\cos 55^\circ}{\sin 35^\circ} - \tan 50^\circ \cot 50^\circ$ is equal to:

- 1. -1
- 2. 2
- 3. 1
- 4. 0

Q.10)- If $A = \frac{1}{7}$ and $B = \frac{1}{8}$ and the average of A, B and C is $\frac{1}{13}$, then the value of C is:

- 1. $-\frac{49}{728}$
- 2. $-\frac{89}{728}$
- 3. $-\frac{31}{728}$
- 4. $-\frac{27}{728}$

Q.11)- At how much per cent above the cost price should a trader mark his goods so that after allowing a discount of 25%, he still gains 5%?

Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

https://t.me/RBE_S

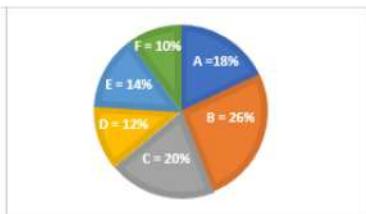
YouTube (Free lectures and job updates): <https://www.youtube.com/c/RBERevolutionByEducation>

1. 32 2. 40 3. 35 4. 50

The Pie chart shows the percentage distributions of total number of laptops (both Dell and HP) sold by six stores in March.

Refer to the pie chart and table carefully and answer the given questions

Total number = 11200



Ratio of the numbers of Dell and HP sold	
Stores	Ratio
A	5 : 4
B	7 : 6
C	1 : 4
D	11 : 10
E	4 : 3
F	3 : 1

Q.12)- What is the ratio of the number of Dell laptops sold by A to that of the HP laptops sold by stores C and D together?

1. 43 : 76 2. 35 : 76 3. 49 : 76 4. 49 : 72

The following table gives the marks obtained by six students in five different subjects in an examination. The numbers in the bracket give the maximum marks in each subject.

Students	Subject (Maximum Marks)				
	English (100)	Hindi (100)	Mathematics (150)	Chemistry (60)	Physics (60)
A	82	54	101	43	60
B	75	48	126	35	52
C	66	68	150	22	48
D	68	73	135	40	55
E	92	69	140	52	32
F	73	54	98	48	41

Q.13)- What are the average marks obtained by all six students in chemistry?

1. 50 2. 35 3. 40 4. 45

Arun sold his goods at a loss of 10%. If the selling price of the goods had been increased by ₹270, there would have been a gain of 8%. What was the cost price (in ₹) of the goods for Arun?

1. 1,500 2. 1,650 3. 1,150 4. 1,800

Q.15)- Which of the following sets is such that all its elements are divisors of the number 2520?

1. 12, 49, 18 2. 16, 15, 14 3. 21, 10, 25 4. 8, 9, 7

Pawan purchases 70 articles for ₹16,875 and sells them at a loss equal to the selling price of 5 articles. What will be the selling price of one article?

1. ₹230 2. ₹235 3. ₹220 4. ₹225

What is the amount (in ₹) of debt that will be discharged in 6 equal instalments of ₹800 each, if the debt is due in 6

Q.17)- years at 5% per annum?

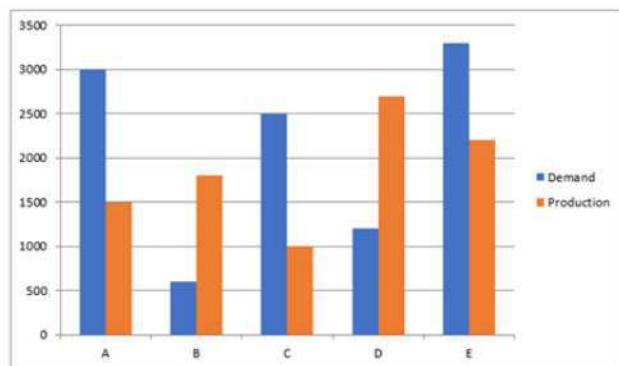
1. 8,000 2. 6,600 3. 5,400 4. 7,500

Two circles of radii 9 cm and 4 cm, respectively, touch each other externally at point A. PQ is the direct common

Q.18)- tangent of those two circles of centres O_1 and O_2 , respectively. The length of PQ is equal to:

1. 13 cm 2. 11 cm 3. 12 cm 4. 10 cm

Study the following graph carefully and answer the questions given below it.



Q.19)- What is the ratio of companies having more demand than production to those having more production than demand?

1. 1 : 1 2. 2 : 3 3. 4 : 1 4. 3 : 2

Q.20)- What is the mean proportional between 3 and 27?

1. 81 2. 15 3. 30 4. 9

Q.21)- A boat can move upstream at 25 km/h and downstream at 35 km/h. What is the speed of the current?

1. 5 km/h 2. 10 km/h 3. 15 km/h 4. 22.5 km/h

Q.22)- Find the compound interest on ₹10,000 for $1\frac{1}{2}$ years at 20% per annum, interest is payable half-yearly.

1. ₹3,310 2. ₹3,320 3. ₹3,305 4. ₹3,315

Simplify the following expression.

Q.23)- $(a + b + c)^2 - (a - b + c)^2 + 4ac$

1. $4(bc + ac)$ 2. $4(ab + bc + ac)$ 3. $2(ab + bc + ac)$ 4. $4(bc + ab)$

The company offers the following four types of successive discounts on a computer which is listed at ₹6,000.

- i) 25% and 15%
- ii) 30% and 10%
- iii) 35% and 5%
- iv) 20% and 20%

Q.24)- Which of these offers is best for a customer?

1. First offer 2. Fourth offer 3. Third offer 4. Second offer

An inlet pipe can fill an empty tank in 51 hours while an outlet pipe drains a completely-filled tank in 76.5 hours. If both the pipes are opened simultaneously when the tank is empty, in how many hours will the tank get completely

Q.25)- filled?

1. 153 2. 178.5 3. 102 4. 127.5

Answer key

Q.1	3	Q.2	3	Q.3	2	Q.4	4	Q.5	2
Q.6	4	Q.7	4	Q.8	3	Q.9	3	Q.10	4
Q.11	2	Q.12	2	Q.13	3	Q.14	1	Q.15	4
Q.16	4	Q.17	3	Q.18	3	Q.19	4	Q.20	4
Q.21	1	Q.22	1	Q.23	2	Q.24	3	Q.25	1

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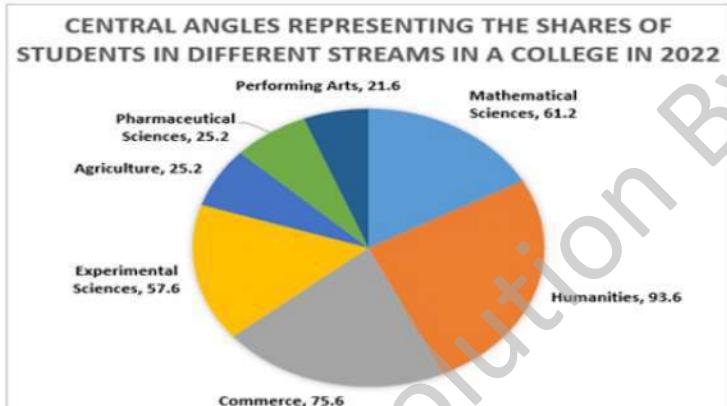
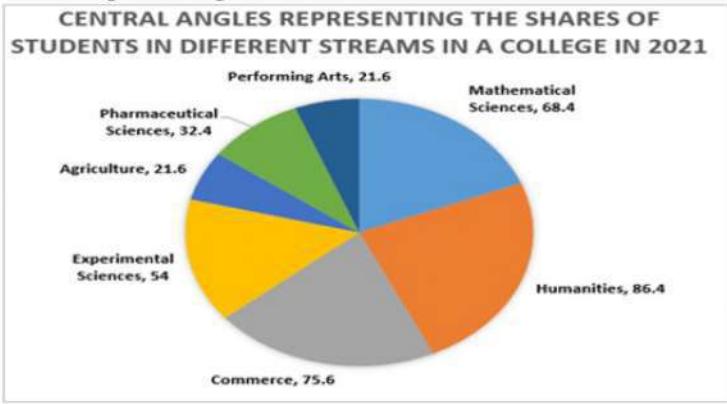
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08/08/2023-> (11:45 AM - 12:45 PM)

The shares of students studying in different streams of a college in the years 2021 and 2022 are reflected in the two pie charts given below.



The total number of students in the college was 60000 in 2021, which rose to 75000 in 2022. What was the percentage change in the number of students opting for the mathematical sciences from 2021 to 2022? [Give your answer correct to the nearest integer value]

Q.1)-

1. 11% 2. 10% 3. 13% 4. 12%

Q.2)- What is the remainder when 3^8 is divided by 7?

1. 4 2. 2 3. 5 4. 6

Q.3)- A shopkeeper sells a table at 25% discount on the marked price and earns a profit of 70%. If he sells the same table at 50% discount, then his new profit percentage will be:

1. $13\frac{1}{3}\%$ 2. $12\frac{1}{2}\%$ 3. $13\frac{1}{2}\%$ 4. $11\frac{1}{3}\%$

The table gives the number of students in each class and the percentage of students in the class who like Hockey, Tennis, Chess and Golf.

Class	Number of Students	Hockey	Tennis	Chess	Golf
A	260	70%	65%	70%	60%
B	180	90%	52%	85%	40%
C	240	90%	80%	60%	80%
D	60	80%	70%	50%	30%

Q.4)- How many students in all the given classes like Hockey?

1. 608 2. 740 3. 614 4. 596

ΔABC is similar to ΔPQR . If the ratio of the perimeter of ΔABC and perimeter of ΔPQR is $24 : 16$ and $PQ = 4.8 \text{ cm}$, then the length (in cm) of AB is:

1. 4.6 2. 7.2 3. 8.6 4. 2.8

Q.6)- The area of a sector of a circle is 616 cm^2 with a central angle of 10° . The radius of the circle is _____ (use $\pi = \frac{22}{7}$)

1. 28 cm 2. 21 cm 3. 48 cm 4. 84 cm

Q.7)- If the volume of a cube is 729 cm^3 , then find the total surface area of the cube.

1. 484 cm^2 2. 482 cm^2 3. 486 cm^2 4. 488 cm^2

Q.8)- The circumference of a circle is 132 cm. The area of circle is: Take $\pi = \frac{22}{7}$

1. 1380 cm^2 2. 1386 cm^2 3. 1322 cm^2 4. 1086 cm^2

A bus travels for three hours at 60 km/h, four hours at 50 km/h and the next five hours at 50 km/h. Find its average speed.

1. 52.5 km/h 2. 50 km/h 3. 52 km/h 4. 46 km/h

Q.10)- If θ is an acute angle and $\cos\theta = \frac{11}{17}$, what is the value of $\tan\theta$?

1. $\frac{13}{11}$ 2. $\frac{2\sqrt{42}}{17}$ 3. $\frac{4\sqrt{10}}{11}$ 4. $\frac{2\sqrt{42}}{11}$

Q.11)- If $x^2 - 5\sqrt{5}x + 1 = 0$, and $x > 0$, what is the value of $(x^3 - \frac{1}{x^2})$?

1. 1331 2. 1296 3. 1364 4. 1244

Q.12)- If $2 : 9 :: 4 : x$, then the value of x is:

1. 42 2. 36 3. 22 4. 18

Q.13)- Two triangles XYZ and UVW are congruent. If the area of ΔXYZ is 58 cm^2 , then the area of ΔUVW will be:

1. 116 cm^2 2. 29 cm^2 3. 15 cm^2 4. 58 cm^2

Q.14)- If $\sqrt{a} = 3b$, then $\frac{a}{b^2}$ is equal to:

1. $\frac{1}{9}$ 2. 9 3. 6 4. $\frac{1}{6}$

A and B together can complete a piece of work in 15 days and B alone can complete it in 21 days. In how many days can A complete it alone?

Q.15)-

1. $52\frac{1}{2}$ days 2. $41\frac{1}{2}$ days 3. $31\frac{1}{2}$ days 4. $57\frac{1}{2}$ days

Shyam purchased a packet of 16 pens and got 4 pens free with it. He marked the price 20% more than the CP. If he did not allow any discount and sold all the 20 pens at this price, then what was his profit percentage?

Q.16)-

1. $37\frac{1}{2}\%$ 2. 36% 3. 50% 4. 48%

Simplify the given expression. $\frac{(0.25)^4 + 2 \times (0.25)^2 + 1 - (0.25)^2}{(0.25)^2 + 0.25 + 1}$

Q.17)-

1. 0.9025 2. 0.8125 3. 0.6755 4. 0.7835

Q.18)- The speed of a car is 63 km/h. What is the distance travelled by it in 10 seconds?

1. 185 m 2. 17.5 m 3. 175 m 4. 1.75 km

In a camp of 70 boys, there are food provisions for 36 days. If 50 more boys join the camp, then how many days will the

Q.19)-

1. 18 days 2. 21 days 3. 24 days 4. 25 days

Simplify the given equation.

Q.20)-

$$\frac{\cot^2 A - 1}{\cot A - 1} = ?$$

1. $\operatorname{cosec}^2 A + \cot A$ 2. $\operatorname{cosec}^2 A - \cot A$ 3. $\cot^2 A - \operatorname{cosec} A$ 4. $\cot^2 A + \operatorname{cosec} A$

Q.21)- What is the approximate present value (in ₹ lakh) of an income of ₹2.1 lakh to be received after 2 years if the rate of interest is 5%?

1. 1.975 2. 1.815 3. 1.905 4. 1.725

Q.22)- If $\operatorname{Tan} \theta + \operatorname{Sec} \theta = a$, then what is $\operatorname{Sec} \theta$ equal to:

1. $\frac{a^2 + 1}{2a}$ 2. $\frac{a^2 - 1}{2a}$ 3. $\frac{(a - 1)}{2a^2}$ 4. $\frac{a + 1}{2a^2}$

A trader sells two LED sets at the same price. There is a gain of 20% on one LED and 20% loss on the second LED.

Q.23)-

Which of the following statements is true?

1. The trader makes a profit of 4%. 2. The trader makes a loss of 4%. 3. The trader makes no profit or no loss. 4.

The trader makes a profit of 2%.

The following table gives the sales of shirts manufactured by companies C1, C2, C3 and C4 over five weeks. Study the table and answer the question that follows.

Week	C1	C2	C3	C4
Week 1	190	226	184	202
Week 2	225	244	214	202
Week 3	240	175	235	275
Week 4	215	235	260	200
Week 5	205	210	265	245

Q.24)- Which company sold the most shirts in these five weeks?

1. C1 2. C4 3. C3 4. C2

In what ratio does a grocer mix tea at ₹26 per kg and ₹32 per kg so that by selling the mixture at ₹30 per kg they may

Q.25)- gain 10%?

1. 7 : 26 2. 16 : 7 3. 26 : 7 4. 7 : 16

Answer key

Q.1	4	Q.2	2	Q.3	1	Q.4	1	Q.5	2
Q.6	4	Q.7	3	Q.8	2	Q.9	1	Q.10	4
Q.11	3	Q.12	4	Q.13	4	Q.14	2	Q.15	1
Q.16	3	Q.17	2	Q.18	3	Q.19	2	Q.20	1
Q.21	3	Q.22	1	Q.23	2	Q.24	3	Q.25	3



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08/08/2023-> (2:30 PM - 3:30 PM)

An article is marked at ₹450. If it is sold at a discount of 20%, then the selling price becomes 1.5 times of its cost

Q.1)- price. What is the cost price (in ₹)?

1. 360
2. 240
3. 330
4. 270

How many solid spheres are made if a metallic cone of radius 12 cm and height 24 cm is melted into sphere of

Q.2)- radius 2 cm each?

1. 105
2. 101
3. 108
4. 103

Q.3)- If $\sin\theta = 5/6$, the value of $\cot\theta \cdot \sin\theta \cdot \cos\theta$ is _____.

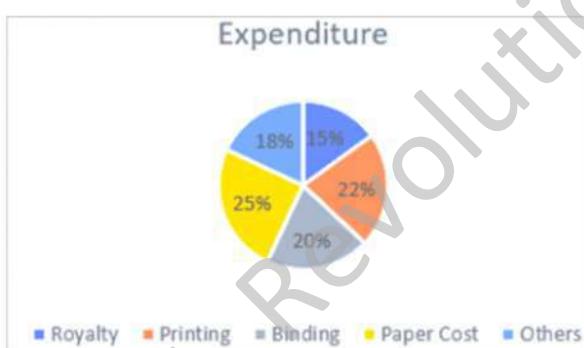
1. $\frac{6}{5}$
2. $\frac{25}{36}$
3. $\frac{5}{6}$
4. $\frac{11}{36}$

A shopkeeper sells a table at a discount of 25% on the marked price and earns a profit of 80%. If he sells the same table

Q.4)- at a 40% discount, then his new profit is:

1. 31%
2. 44%
3. 33%
4. 41%

The following pie chart shows the percentage distribution of the expenditure incurred in publishing a book.



Q.5)- Find the paper cost, if the royalty is ₹22,500

1. ₹32,500
2. ₹37,500
3. ₹30,000
4. ₹33,000

From a cask filled with wine, 75 litres are first drawn and replaced with water. From this mixture, 60 litres are drawn and replaced with water. The ratio of wine to water in the cask is now 3 : 2. How many litres of wine did the cask

Q.6)- initially hold?

1. 225
2. 250
3. 375
4. 300

Q.7)- Find the value of $\frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} + 2$.

1. $1 + 2 \sec A$
2. $2 - \sec A$
3. $2 + \sec A$
4. $2(1 + \sec A)$

Two numbers, when divided by a certain divisor, leave the remainder 57. When sum of the two numbers is divided by the same divisor, the remainder is 49. The divisor is:

Q.8)-

1. 56
2. 57
3. 49
4. 65

Q.9)- Mahima purchased a Saree for ₹792 after successive discounts of 20% and 12%. The marked price of the Saree was:

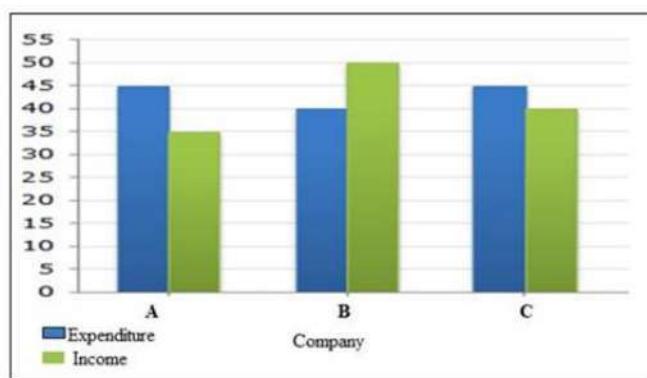
1. ₹968
2. ₹1,025
3. ₹875
4. ₹1,125

If the curved surface area of a cylinder is increased by 20%, and height is decreased by 4%, then the net decrease

Q.10)- or increase in the volume will be:

1. 36% decrease
2. 20% increase
3. 50% increase
4. 33% decrease

The following bar graph shows the incomes and expenditures (in million rupees) of three companies in the year 2020. Study the graph and answer the question that follows.



Which company earned the maximum percentage profit (Profit is calculated on expenditure) in the year 2020, and by what percentage?

Q.11)-

1. Company A, by 18%
2. Company B, by 20%
3. Company B, by 25%
4. Company C, by 15%

In a linear race of 1000 m, Prakash beats Ved by 280 m, while Ved beats Rahul by 100 m. By how many metres does Prakash beat Rahul, in the same race?

1. 346
2. 350
3. 352
4. 348

ΔLON and ΔLMN are two right-angled triangles with common hypotenuse LN such that $\angle LON = 90^\circ$ and $\angle LMN = 90^\circ$. LN is the bisector of $\angle OLM$. If LN = 29 cm and ON = 20 cm, then what is the perimeter (in cm) of ΔLMN ?

Q.13)-

1. 67
2. 62
3. 65
4. 70

Q.14)- If $x^4 + \frac{1}{x^4} = 194$, $x > 0$, then find the value of $x^3 + \frac{1}{x^3} + x + \frac{1}{x}$.

1. 76
2. 66
3. 56
4. 46

By selling a watch for ₹1,600, a person gets profit that is equal to the loss of selling the same watch for ₹1,400. If the person wants to get a profit of 20%, at what price should he sell the watch?

1. ₹1,800
2. ₹1,700
3. ₹1,850
4. ₹1,750

Q.16)- On a sum of money for 2 years compound interest and simple interest are ₹550 and ₹500. Find the rate of interest (in per annum).

1. 40%
2. 10%
3. 20%
4. 30%

Two circles with diameters 50 cm and 58 cm, respectively, intersect each other at points A and B, such that the length of the common chord is 40 cm. Find the distance (in cm) between the centres of these two circles.

- Q.17)-** 1. 34 2. 37 3. 36 4. 35

The average number of runs scored by a cricketer in 42 innings is 30. The difference between his maximum and minimum scores in an inning is 100. If these two innings are not taken into consideration, then the average score of the remaining 40 innings is 28. What are the maximum runs scored by him in an inning?

- Q.18)-** 1. 120 2. 105 3. 115 4. 110

In an army camp, there is food provision for 500 cadets for 25 days. If 125 more persons join the army camp on the first day itself, then for how many days will the provision last?

- Q.19)-** 1. 20 2. 15 3. 10 4. 25

Q.20)- In $\triangle ABC$, $\angle A = 5x - 60^\circ$, $\angle B = 2x + 40^\circ$, $\angle C = 3x - 80^\circ$. Find $m\angle A$.

1. 75° 2. 90° 3. 80° 4. 60°

Q.21)- If θ is an acute angle and $\sin\theta = \frac{13}{19}$, what is the value of $\cos\theta$?

1. $\frac{6}{19}$ 2. $\frac{10\sqrt{2}}{19}$ 3. $\frac{14}{19}$ 4. $\frac{8\sqrt{3}}{19}$

Q.22)- The length of the common tangent PQ for two circles touching externally is 16 cm. If the radius (OP) of the bigger circle is 20 cm, then the radius (RQ) of the smaller circle is:

1. 3.2 cm 2. 3.6 cm 3. 3.5 cm 4. 3.8 cm

Q.23)- If $a + b + c = 5$ and $a^2 + b^2 + c^2 = 15$, then find the value of $a^3 + b^3 + c^3 - 3abc - 27$.

1. 23 2. 27 3. 25 4. 21

The following table shows the month-wise temperature of four cities from January to May 2022 (in degree Celsius).

Months	Hyderabad	Bangalore	Pune	Kolkata
January	26°	22°	24°	25°
February	27°	24°	25°	26°
March	34°	30°	32°	32°
April	37°	32°	35°	34°
May	42°	36°	40°	40°

Q.24)- Which city recorded the maximum temperature in all five months compared with the other cities?

1. Pune 2. Bangalore 3. Hyderabad 4. Kolkata

Q.25)- If $x^2 + y^2 = 427$ and $xy = 202$, then find the value of $\frac{x+y}{x-y}$.

1. $\sqrt{\frac{835}{23}}$ 2. $\sqrt{\frac{830}{29}}$ 3. $\sqrt{\frac{831}{23}}$ 4. $\sqrt{\frac{830}{23}}$

Answer key

Q.1	2	Q.2	3	Q.3	4	Q.4	2	Q.5	2
Q.6	4	Q.7	4	Q.8	4	Q.9	4	Q.10	3
Q.11	3	Q.12	3	Q.13	4	Q.14	3	Q.15	1
Q.16	3	Q.17	3	Q.18	1	Q.19	1	Q.20	3
Q.21	4	Q.22	1	Q.23	1	Q.24	3	Q.25	3

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By: Shubham Jain
(Selected as GST Inspector)

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08/08/2023-> (5:15 PM - 6:15 PM)

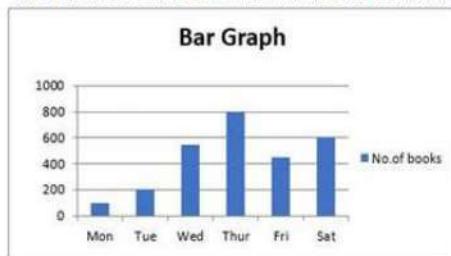
The marked price of an item is 25% more than that of its cost price. If a discount of 10% is given on the marked price, then the gain percentage is:

- Q.1)- 1. $10\frac{1}{2}\%$ 2. $13\frac{1}{2}\%$ 3. $9\frac{1}{2}\%$ 4. $12\frac{1}{2}\%$

The arc length of a sector of a circle that subtends a 22.5° angle at the centre is given as 16.5 cm. What will be the radius (in cm) of the circle? [Use $\pi = \frac{22}{7}$]

- Q.2)- 1. 35 2. 48 3. 49 4. 42

The table shows the sales of books from a school cooperative store in week days.



Q.3)- In how many days are the sales of books below the average sale?

1. 2 2. 3 3. 4 4. 1

Q.4)- If $\sec \theta + \tan \theta = \frac{1}{\sqrt{3}}$, then the positive value of $\cot \theta + \cos \theta$ is:

1. $\frac{\sqrt{3}}{2}$ 2. $\frac{2}{3\sqrt{3}}$ 3. $\frac{3\sqrt{3}}{2}$ 4. $\frac{2}{\sqrt{3}}$

Q.5)- If $a : b = 5 : 7$, then $(6a^2 - 2b^2) : (b^2 - a^2)$ will be:

1. 21 : 5 2. 13 : 6 3. 12 : 5 4. 17 : 8

Q.6)- The value of $\frac{3+8\times 8+8 \text{ of } 8+7+7\times 2}{5+5 \text{ of } 4+3\times 3+3-3+2}$ is:

1. $2\frac{3}{7}$ 2. $1\frac{4}{7}$ 3. $1\frac{3}{5}$ 4. $2\frac{2}{3}$

Q.7)- If $\sec A = \frac{17}{15}$, then what is the value of $\cot A$?

1. $\frac{8}{15}$ 2. $\frac{15}{21}$ 3. $\frac{15}{7}$ 4. $\frac{15}{8}$

If the simple interest on ₹2,500 is more than the interest on ₹1,500 by ₹360 in 3 years, then find the rate of interest per annum.

- Q.8)-** 1. 11% 2. 9% 3. 10% 4. 12%

Raman spends 75% of his income. If his income increases by 20% and expenditure also increases by 10%, then by what per cent will Raman's savings increase?

- Q.9)-** 1. 45% 2. 40% 3. 50% 4. 35%

A mobile is marked at a price 25% above its cost price. At what discount percentage it should be sold to make a 5% profit?

- Q.10)-** 1. 16% 2. 15% 3. 18% 4. 17%

Q.11)- A is twice a good worker as B and together they finish the work in 20 days. In how many days can A alone do it?

- Q.12)-** 1. 25 days 2. 36 days 3. 20 days 4. 30 days

In a triangle ABC, AP, the bisector of $\angle A$, is perpendicular to BC at point P. The measures of BP and PC are x and 3y, respectively. The measures of AB and AC are $4x$ and $(5y + 21)$, what is the value of $(x + y)$?

- Q.13)-** 1. 12 2. 18 3. 21 4. 15

Study the given table and answer the question that follows.

Marks obtained (out of 100) by four students P, Q, R, and S in four subjects in an examination are given in the table.

Subjects	Students			
	P	Q	R	S
Mathematics	80	56	45	78
Statistics	78	60	54	70
Physics	70	50	40	60
Geology	65	52	49	57

Q.13)- Which student has scored the marks in the ratio of 10 : 13 in Physics and Mathematics?

- Q.14)-** 1. P 2. S 3. R 4. Q

If $(y - \frac{1}{y}) = -9$, what will be the value of $(y^5 - \frac{1}{y^5})$?

- Q.15)-** 1. - 62757 2. - 62748 3. - 59049 4. - 62739

If the two interior opposite angles of an exterior angle of a triangle are 35° and 65° , then the measurement of the exterior angle is:

- Q.16)-** 1. 135° 2. 125° 3. 100° 4. 90°

If $(4y - \frac{4}{y}) = 11$, find the value of $(y^2 + \frac{1}{y^2})$.

- Q.17)-** 1. $7\frac{9}{16}$ 2. $5\frac{9}{16}$ 3. $9\frac{9}{16}$ 4. $9\frac{11}{16}$

Basanthi deposited ₹50,000 in a co-operative bank which is giving compound interest at the rate of 10% per annum.

What will be her interest in the 3rd year?

- Q.18)-** 1. ₹66,550 2. ₹6,050 3. ₹10,050 4. ₹5,050

What is the area of a triangular flower bed of a garden whose perimeter is 20 metres and two sides are 5 metres and 6

Q.18)- metres.

1. $4\sqrt{5} \text{ m}^2$ 2. $10\sqrt{2} \text{ m}^2$ 3. $2\sqrt{10} \text{ m}^2$ 4. $5\sqrt{2} \text{ m}^2$

Q.19)- Find the radius of the circle $x^2 + y^2 = 25$.

1. 2 units 2. 5 units 3. 12 units 4. 25 units

A train traveling at 80 km/h crosses another train traveling in the same direction at 26 km/h in 30 seconds. What is the

Q.20)- combined length of both the trains?

1. 350 m 2. 400 m 3. 550 m 4. 450 m

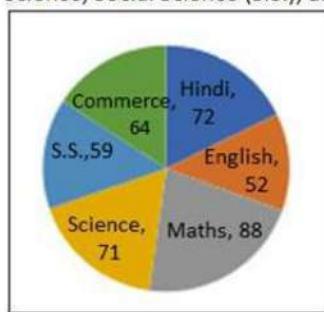
A car covers the first 210 km at a speed of 70 km/h. It covered the next 170 km at a speed of 85 km/h. What is its average speed?

Q.21)-

1. 76 km/h 2. 72 km/h 3. 74 km/h 4. 68 km/h

Study the given pie chart and answer the question that follows.

The pie chart represents the marks (out of 100) obtained by Shweta in different subjects – Hindi, English, Maths, Science, Social Science (S.S.), and Commerce in her class-X examination.



Q.22)- The marks obtained in English and S.S. are what per cent less than the marks obtained in Hindi and Maths?

1. $30\frac{5}{8}\%$ 2. $31\frac{5}{8}\%$ 3. $31\frac{1}{8}\%$ 4. $30\frac{1}{8}\%$

Q.23)- Evaluate $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$, given that $\sqrt{6} = 2.45$.

1. 8.8 2. 7.7 3. 6.6 4. 9.9

A sells a cycle to B at a profit of 33% and B sells it to C at a loss of 25%. If C bought the cycle for ₹3,059, then the cost

Q.24)- price of it for A was:

1. ₹ $5,014\frac{2}{3}$ 2. ₹ $2,044\frac{1}{3}$ 3. ₹ $4,054\frac{1}{3}$ 4. ₹ $3,066\frac{2}{3}$

Q.25)- The value of $\frac{\sec 54^\circ}{\cosec 36^\circ} + \frac{\tan 70^\circ}{\cot 20^\circ} - 2\tan 45^\circ$ is equal to:

1. 2 2. 0 3. 1 4. 3

Q.1	4	Q.2	4	Q.3	1	Q.4	3	Q.5	2
Q.6	4	Q.7	4	Q.8	4	Q.9	3	Q.10	1
Q.11	4	Q.12	1	Q.13	2	Q.14	4	Q.15	3
Q.16	3	Q.17	2	Q.18	2	Q.19	2	Q.20	4
Q.21	1	Q.22	1	Q.23	4	Q.24	4	Q.25	2



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By: Shubham Jain
(Selected as GST Inspector)

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09/08/2023-> (9:00 AM - 10:00 AM)

The table given below shows the number of aerated drinks—A, B, C, D—manufactured (in thousands) by a company over the years.

YEAR	Aerated Drinks			
	A	B	C	D
2019	250	200	140	115
2020	200	230	170	120
2021	260	210	195	135
2022	275	175	190	155

Q.1)- Which aerated drink has the highest manufacturing number from 2019 to 2022?

- 1. A
- 2. C
- 3. D
- 4. B

Q.2)- If 7 divides the integer n, then the remainder is 2. What will be the remainder if 9n is divided by 7?

- 1. 5
- 2. 3
- 3. 1
- 4. 4

In what ratio, wheat at ₹23 per kg should be mixed with wheat at ₹14 per kg so that on selling the mixture at ₹20 per kg

Q.3)- there is a profit of 25%?

- 1. 2:3
- 2. 5:7
- 3. 2:7
- 4. 3:5

Q.4)- Simple interest on a certain sum is one-fourth of the sum and the interest rate per annum is four times the number of years. If the rate of interest increases by 2%, then how much will the simple interest (in ₹) be on ₹3,600 for 6 years?

- 1. 2,642
- 2. 2,514
- 3. 2,592
- 4. 2,562

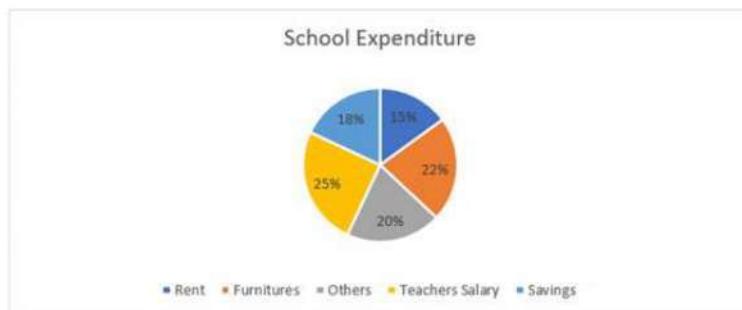
Q.5)- The largest chord of the circle is:

- 1. tangent
- 2. diameter
- 3. point
- 4. radius

Q.6)- If $\Delta ABC \sim \Delta PQR$, the ratio of perimeter of ΔABC to perimeter of ΔPQR is 36 : 23 and $QR = 3.8$ cm, then the length of BC is:

- 1. $5\frac{109}{115}$ cm
- 2. $4\frac{103}{121}$ cm
- 3. $3\frac{109}{121}$ cm
- 4. $3\frac{107}{115}$ cm

The following pie chart shows the percentage distribution of school expenditure.



Q.7)- If the teacher's salary and rent together is ₹45 lakhs, then find the savings.

1. ₹16,87,500 2. ₹24,75,000 3. ₹22,53,000 4. ₹20,25,000

Chords \overline{AB} and \overline{CD} of a circle intersect inside the circle at point F. If $m(\overline{AF}) = 2.4$ cm, $m(\overline{BF}) = 1.8$ cm, and $m(\overline{CD}) = 5.7$ cm,

Q.8)- what is the length (in cm) of the longer of the two line segments, \overline{CF} and \overline{DF} ?

1. 4.5 2. 5.4 3. 3.6 4. 4.8

Q.9)- If $\frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} = \frac{4}{5}$, then the value of $\frac{\operatorname{cosec}^2 \theta}{2 - \operatorname{cosec}^2 \theta}$ is:

1. $\frac{31}{30}$ 2. $\frac{16}{25}$ 3. $\frac{40}{41}$ 4. $\frac{41}{40}$

Q.10)- A table fan is marked at ₹1,700 and a discount of 15% is given. What is its selling price (in ₹)?

1. 1,445 2. 1,454 3. 1,554 4. 1,425

Q.11)- Find the fourth proportion of the numbers $\frac{4}{3}$ rd of 15, $\frac{4}{5}$ th of 25, $\frac{3}{7}$ th of 35:

1. 60 2. 65 3. 55 4. 50

Q.12)- The algebraic expression $4x^2 - y^2 + 6y - 9$ is equal to _____.

1. $(2x + y - 3)^2$ 2. $(2x + y - 3)(2x - y + 3)$ 3. $(2x - y - 3)(2x - y + 3)$ 4. $(2x + y + 3)^2$

Q.13)- $\triangle PQR$ is right angled at Q. If PQ = 12 cm PR = 13 cm, find $\tan P + \cot R$.

1. $\frac{12}{10}$ 2. 0 3. $\frac{10}{12}$ 4. $\frac{9}{10}$

Q.14)- The difference between the simple interest and the compound interest on a certain amount at 9 % per annum for two years is ₹ 162, what is the principal?

1. ₹ 19000 2. ₹ 20000 3. ₹ 19700 4. ₹ 19500

Q.15)- If $x^2 - 4x - 1 = 0$, then find the value of $x^2 + \frac{1}{x^2} - 5$.

1. 15 2. 12 3. 17 4. 13

Q.16)- A spends 68% of his monthly income. If A's monthly income increases by 25% and his monthly saving increases by 15%, then the percentage increase in his monthly expenditure will be:

1. $31\frac{6}{17}\%$ 2. $33\frac{7}{17}\%$ 3. $29\frac{12}{17}\%$ 4. $27\frac{13}{17}\%$

Q.17)- A tradesman marks his goods 25% above the cost price and allows his customers a discount of 12% on their bill. How much % profit tradesman realizes?

1. 11% 2. 12% 3. 10% 4. 13%

Two circles touch each other externally at any point C. PQ is the direct common tangent to both the circles touching the circles at point P and point Q. If the radii of the circles are 36 cm and 16 cm, respectively, then the length of PQ is:

Q.18)-

1. 24 cm 2. 42 cm 3. 48 cm 4. 36 cm

Q.19)- Anil completed a certain journey by a car. If he covered 35% of the distance at 70 km/h. 40% of the distance at 80 km/h and the remaining distance at 50 km/h, his average speed (in km/h) for the entire journey is:

1. $66\frac{3}{3}$ km/h 2. $66\frac{2}{3}$ km/h 3. $66\frac{4}{3}$ km/h 4. $66\frac{1}{3}$ km/h

Q.20)- X can do a piece of work in 14 days, Y can complete the same work in 28 days and Z can do it in 42 days. In how many days can X, Y and Z together complete the work?

1. $7\frac{7}{11}$ 2. $7\frac{5}{11}$ 3. $7\frac{9}{11}$ 4. $7\frac{3}{11}$

Q.21)- If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$, then the value of A+B is:

1. 45° 2. 60° 3. 30° 4. 15°

Q.22)- A man sells a good at 5% profit. If he had sold it at a 10% profit, he would have received ₹175 more. What is the selling price of the good?

1. ₹3,850 2. ₹3,675 3. ₹3,500 4. ₹3,750

Q.23)- If $x = (\sqrt{6} - 1)^{\frac{1}{3}}$, then the value of $(x - \frac{1}{x})^3 + 3(x - \frac{1}{x})$ is:

1. $\frac{4\sqrt{6}-6}{5}$ 2. $\frac{2\sqrt{6}-6}{5}$ 3. $\frac{4\sqrt{6}-6}{3}$ 4. $\frac{4\sqrt{3}-6}{5}$

Q.24)- The volume of a solid sphere is $4500\pi\text{ cm}^3$. The surface area of the solid sphere is:

1. $850\pi\text{ cm}^2$ 2. $700\pi\text{ cm}^2$ 3. $810\pi\text{ cm}^2$ 4. $900\pi\text{ cm}^2$

Table shows year wise road accidents registered in a city during 2015 - 2018.

Years \ Accidents	Minor	Injury	Serious	Casualties
2015	160	125	55	30
2016	150	120	50	35
2017	210	170	30	25
2018	190	130	60	40

What is the percentage reduction in serious from the year 2016 to 2017?

Q.25)-

1. 25% 2. 35% 3. 40% 4. 20%

Answer key

Q.1	1	Q.2	4	Q.3	3	Q.4	3	Q.5	2
Q.6	1	Q.7	4	Q.8	4	Q.9	4	Q.10	1
Q.11	1	Q.12	2	Q.13	3	Q.14	2	Q.15	4
Q.16	3	Q.17	3	Q.18	3	Q.19	2	Q.20	1
Q.21	1	Q.22	2	Q.23	1	Q.24	4	Q.25	3

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09/08/2023-> (11:45 AM - 12:45 PM)

Table given below shows the performance of students of class-10 according to NAS survey in Delhi.

	Below Basic	Basic	Proficient	Advance
MIL	40	35	20	5
Maths	19	45	25	11
Science	41	29	25	5
Social Science	34	21	33	12
English	8	5	34	52

Q.1)- The highest average performance is for _____.

1. Advanced 2. Proficient 3. Below Basic 4. Basic

Ravi initially had a certain number of chocolates, while Bhanu initially had 80% of the number of chocolates that Ravi initially had. Ravi gave 10% of his chocolates to his sister while Bhanu received from his uncle another 35% of the number of chocolates he initially had. If Bhanu finally had 54 chocolates, how many chocolates did Ravi give to his

Q.2)- sister?

1. 4 2. 6 3. 5 4. 3

If $\cot A = \frac{5}{12}$, find the value of the following expression.

$$\frac{5(1 - \cos^2 A)}{6(1 - \sin^2 A)}$$

1. $\frac{24}{25}$ 2. $\frac{144}{25}$ 3. $\frac{24}{5}$ 4. $\frac{144}{5}$

A train travelling from Mumbai to Goa covered the first 420 km at a speed of 60 km/h and then covered the remaining 195 km at a speed of 65 km/h. Find its average speed in km/h.

1. 61.5 2. 62 3. 62.3 4. 63.5

Sneha fixes the marked price of an item 40% above its cost price. What is the percentage of discount allowed to gain 12%?

1. 34% 2. 40% 3. 20% 4. 25%

Q.6)- The cost price of 240 articles is the same as the selling price of x articles. If profit is 20%, find the value of x.

1. 180 2. 200 3. 240 4. 21

A shopkeeper allows a 12% additional discount on an initial discount of 20% for a shirt. If he sells the shirt at ₹704, then the marked price is:

1. ₹844.88 2. ₹788.48 3. ₹1,000 4. ₹800

If 300 calories are burnt in every 5 km, how many calories were burnt in the whole week?

Week days	Distance jogged (km)
Sunday	2.5
Monday	4.0
Tuesday	2.5
Wednesday	3.5
Thursday	1.5
Friday	2.5
Saturday	1.5

Q.8)-

1. 5400 calories 2. 1410 calories 3. 1080 calories 4. 1310 calories

Q.9)- A solid cuboid is melted to form a number of cubes. If the length, breadth and height of a cuboid are 20 cm, 16 cm and 8 cm, and the edge of each cube is 4 cm, then the number of cubes is:

1. 44 2. 50 3. 48 4. 40

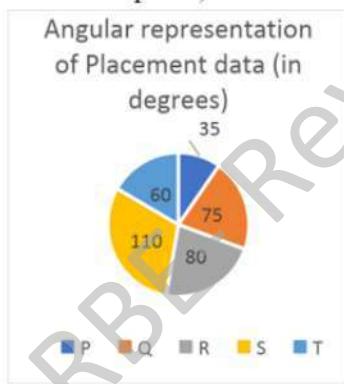
Q.10)- In a right-angled triangle XYZ, if $X = 60^\circ$ and $Y = 30^\circ$, then find the value of $\sin(X - Y)$.

1. $\frac{1}{2}$ 2. $\frac{3}{4}$ 3. $\frac{2}{3}$ 4. $\frac{3}{5}$

Q.11)- What will be the greatest number $32a78b$, which is divisible by 3 but NOT divisible by 9? (Where a and b are single digit numbers).

1. 329784 2. 324781 3. 326787 4. 329787

The pie chart shows the angular representation of placement data in five different courses. If the total number of candidates qualified is 1,44,000, then the number of candidates in Q is what per cent of candidates in S? (Rounded off to 2 decimal places)



Q.12)-

1. 68.16% 2. 68.18% 3. 68.15% 4. 68.12%

Q.13)- If $(a + b + c) = 17$, and $(a^2 + b^2 + c^2) = 101$, find the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$.

1. 16 2. 12 3. 10 4. 14

Q.14)- The radius of a circle is 5 cm and the length of one of its chords is 8 cm. Find the distance of the chord from the centre.

1. 3 cm 2. 2 cm 3. 5 cm 4. 4 cm

Simplify the given expression.

$$\frac{0.24 \times 0.24 \times 0.24 - 0.008}{0.24 \times 0.24 + 0.048 + 0.04}$$

1. 0.01 2. 0.02 3. 0.03 4. 0.04

Q.15)- A money-lender claims he lends money at a simple rate of interest of 8% per annum. But he cleverly includes the interest amount in the principal when he calculates it every six months. The effective rate of interest becomes:

1. 8.2% 2. 8.16% 3. 8.8% 4. 8.25%

Q.17)- From a cask of milk containing 64 litres, 8 litres are drawn out and the cask is filled up with water. If the same process is repeated a second, then a third time, what will be the proportion of milk to water in the resulting mixture?

1. 343 : 169 2. 443 : 179 3. 343 : 179 4. 333 : 169

Q.18)- The mean proportion of 6 and 54 is:

1. 9 2. 18 3. 6 4. 12

Q.19)- Two circles touch each other externally at points P and AB is a direct common tangent which touches the circles at A and B, respectively. $\angle APB$ is:

1. 90° 2. 80° 3. 100° 4. 45°

Q.20)- If $\frac{x^2 + 1}{x} = 5$, then find the value of $x^4 + \frac{1}{x^4} - 36$.

1. 491 2. 149 3. 194 4. 419

Q.21)- The marked price of a saree is ₹3,800 and it is available for ₹3,230. What is the rate of discount?

1. 15% 2. 18% 3. 12% 4. 10%

Q.22)- Let ABC and PQR be two congruent right-angled triangles such that $\angle A = \angle P = 90^\circ$. If BC = 13 cm and PR = 12 cm, then find the length of AB.

1. 10 cm 2. 5 cm 3. 25 cm 4. 20 cm

Q.23)- The given expression is equal to: $\frac{\sin^4 A + \cos^4 A}{1 - 2\sin^2 A \cos^2 A}$

1. 0 2. 2 3. 1 4. -1

Q.24)- The length of the chord of a circle is 8 cm and the perpendicular distance between the centre and the chord is 3 cm then the diameter of the circle is equal to:

1. 10 cm 2. 3 cm 3. 5 cm 4. 7 cm

Q.25)- During a donation drive week of school, students determined to donate an average sum of ₹8,000 on each working day of the School, collectively (there was no holiday in the donation week except Sunday). From Monday to Friday, they collected ₹7,230, ₹6,435, ₹6,927, ₹6,855, and ₹6,562, respectively. How much they must collect on Saturday to meet their target?

1. ₹13,991 2. ₹6,000 3. ₹4,991 4. ₹6,991

Answer key

Q.1	3	Q.2	3	Q.3	3	Q.4	1	Q.5	3
Q.6	2	Q.7	3	Q.8	3	Q.9	4	Q.10	1
Q.11	1	Q.12	2	Q.13	4	Q.14	1	Q.15	4
Q.16	2	Q.17	1	Q.18	2	Q.19	1	Q.20	1
Q.21	1	Q.22	2	Q.23	3	Q.24	1	Q.25	1

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By: Shubham Jain
(Selected as GST Inspector)

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09/08/2023-> (2:30 PM - 3:30 PM)

The lengths of the two sides of a triangle are 14 cm and 9 cm. Which of the options below can be the length of the third

Q.1)- side?

- 1. 24 cm
- 2. 5 cm
- 3. 17 cm
- 4. 23 cm

Q.2)- $\tan \theta = \frac{3}{4}$, find the value of expression $\frac{1+\sin\theta}{1-\sin\theta}$:

- 1. 5
- 2. 4
- 3. 3
- 4. 8

Simplify the expression:

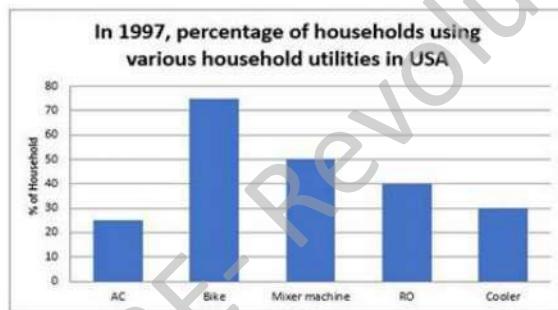
Q.3)- $(c+d)^2 - (c-d)^2$

- 1. $(c^2 + d^2)$
- 2. $2(c^2 + d^2)$
- 3. $2cd$
- 4. $4cd$

The average of 18 integers is found to be 41. It was detected that by mistake the integer 127 was copied as 341, while calculating the average. Then the correct average is:

- 1. $23\frac{1}{7}$
- 2. $29\frac{1}{9}$
- 3. $33\frac{1}{9}$
- 4. $37\frac{1}{3}$

Study the following graph and answer the question given below:



Q.5)- In 1997, if the total number of households was 830 million, then what would be the number of households (in million) having RO?

- 1. 332
- 2. 209
- 3. 525
- 4. 419

Q.6)- $\cos 2\theta = \underline{\hspace{2cm}}$.

- 1. $2\cos^2 \theta - 1$
- 2. $1 - \sin^2 \theta$
- 3. $2\sin^2 \theta - 1$
- 4. $1 - 2\cos^2 \theta$

Q.7)- The marked price of a school bag was ₹550. This price was 10% above the cost price. It was sold at a discount of 10% on the marked price. Find the gain or loss percentage.

- 1. Gain 0.1%
- 2. Loss 1%
- 3. Loss 0.1%
- 4. Gain 1%

Q.8)- What is the present value of ₹9,360 at an interest rate 20% at the end of two years compounded annually?

Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

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1. ₹6,450 2. ₹6,550 3. ₹6,400 4. ₹6,500

On an item having a marked price of ₹1,600, successive discounts of $y\%$ and $z\%$ were offered. As a result, the item was sold for ₹1,056. Which of the options below CANNOT be a set of values for y and z ?

- Q.9)- 1. $y = 20, z = 17.5$ 2. $y = 4, z = 31.25$ 3. $y = 12, z = 25$ 4. $y = 22, z = 15.5$

In a circle, two chords AB and CD intersect each other internally at point P. If AB = 16 cm, PB = 6 cm and PD = 12 cm, then the value of PC (in cm) is equal to:

- Q.10)- 1. 3 2. 8 3. 5 4. 6

Q.11)- How long will it take for a sum of ₹450 to accumulate ₹81 in interest at a simple interest rate of 4.5% per annum ?

1. 3 years 2. 3.5 years 3. 4.5 years 4. 4 years

Q.12)- If $a^2 + b^2 + c^2 = ab + bc + ca$, then the value of $\frac{11a^4+13b^4+15c^4}{16a^2b^2+19b^2c^2+17c^2a^2}$ is:

1. $1\frac{3}{4}$ 2. $\frac{1}{4}$ 3. $1\frac{1}{3}$ 4. $\frac{3}{4}$

Simplify:

Q.13)- $[\frac{1}{5} \text{ of } (35-5)+4]^2 - [9 - \{7 + (2 - 3)\} + 5]^2$

1. 36 2. 25 3. 64 4. 100

The marked price of 85 items was equal to the cost price of 153 items. The selling price of 104 items was equal to the marked price of 65 items. Calculate the percentage profit or loss from the sale of each item.

- Q.14)- 1. 12.25% profit 2. 12.5% loss 3. 15% profit 4. 12.5% profit

A shopkeeper marked the price 18% more than its cost price. If he allows a discount of 24%, then find his loss per cent.

- Q.15)- 1. 15.75% 2. 16.43% 3. 12.25% 4. 10.32%

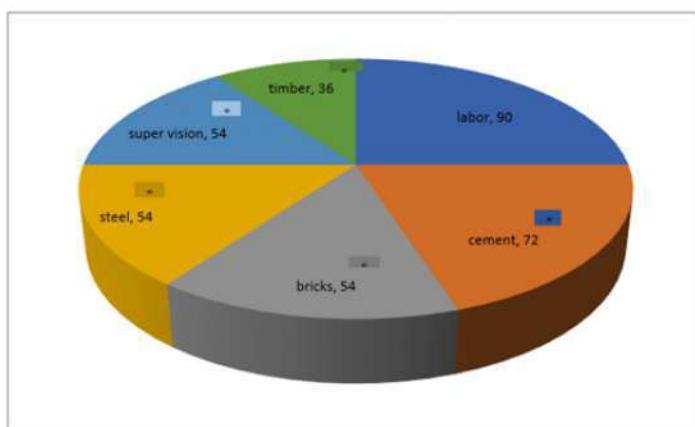
The ratio of Ram's salary to Shyam's salary is 3 : 4. The ratio of Shyam's salary to Ghanshyam's salary is 5 : 6. What will be the ratio of Ram's salary to Ghanshyam's salary?

- Q.16)- 1. 3 : 5 2. 3 : 8 3. 4 : 5 4. 5 : 8

Q.17)- ΔABC is an equilateral triangle. The side BC is produced to point D. If A joins D and $BC=CD$, then the degree measure of angle CAD is equal to:

1. 45° 2. 18° 3. 15° 4. 30°

The pie chart shows the cost of construction of a house . (in degrees)



Q.18)- The amount spent on labour exceeds the amount spent on cement by:

1. 18% of the total cost 2. 5% of the total cost 3. 12% of the total cost 4. 10% of the total cost

Simplify the following:

Q.19)- $7(\cot 11^\circ \cot 13^\circ \cot 19^\circ \cot 29^\circ \cot 61^\circ \cot 71^\circ \cot 77^\circ \cot 79^\circ)$

1. 1 2. 7 3. -1 4. -7

Q.20)- Aastha spends 15% of her total income on travelling and 20% of the rest income on food and then donates ₹380 and after that, she saves ₹2,000. Find her total income (in ₹).

1. 3,650 2. 3,500 3. 3,600 4. 3,800

Q.21)- If $a + b + c = 13$ and $ab + bc + ca = 45$, find $a^2 + b^2 + c^2$.

1. 79 2. 65 3. 57 4. 85

Q.22)- The length, breath of a cuboidal box are 25 cm and 15 cm, respectively. If the volume of the box is 1875 cm^3 , then the height of the box (in cm) is:

1. 5.5 2. 4.5 3. 5.0 4. 4.0

Q.23)- One litre milk costs ₹40. Water is mixed with milk and the mixture was sold at ₹30 per litre. Find the ratio of water and milk in the mixture.

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

Q.24)- Find the length of a tangent drawn to a circle with radius 8 cm from a point 17 cm from the centre of the circle.

1. 12 cm 2. 10 cm 3. 15 cm 4. 14 cm

Study the given table and answer the question that follows.

The table indicates the number of students studying in three disciplines in four colleges.

Disciplines	Colleges			
	A	B	C	D
Mathematics	200	300	300	350
Statistics	250	320	400	250
Home Science	320	340	300	450

Q.25)- Which college has the maximum number of students in Statistics?

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1. B 2. C 3. D 4. A

Answer key

Q.1	3	Q.2	2	Q.3	4	Q.4	2	Q.5	1
Q.6	1	Q.7	2	Q.8	4	Q.9	4	Q.10	3
Q.11	4	Q.12	4	Q.13	1	Q.14	4	Q.15	4
Q.16	4	Q.17	4	Q.18	2	Q.19	2	Q.20	2
Q.21	1	Q.22	3	Q.23	1	Q.24	3	Q.25	2

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By: Shubham Jain
(Selected as GST Inspector)
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09/08/2023-> (5:15 PM - 6:15 PM)

Q.1)- Which of the following expressions is equal to the expression $\frac{x^2-3x+2}{x^2-4}$?

1. $\frac{x+1}{x-2}$ 2. $\frac{x-1}{x+2}$ 3. $\frac{x+1}{x+2}$ 4. $\frac{x-1}{x-2}$

Q.2)- What is the fourth proportional of $3\sqrt{5}$, $5\sqrt{8}$ and $3\sqrt{10}$?

1. $10\sqrt{5}$ 2. $40\sqrt{2}$ 3. 30 4. 20

Q.3)- If $\tan \theta = \frac{8}{15}$, then the value of $\sqrt{\frac{1-\sin \theta}{1+\sin \theta}}$ is:

1. $\frac{1}{5}$ 2. $\frac{3}{5}$ 3. $\frac{2}{5}$ 4. $\frac{4}{5}$

Study the given table and answer the question that follows.

The table represents the mathematics marks of five students.

Name	Ajay	Pronoy	Mahendra	Jharna	Dipti
Marks	85	72	70	84	94

Q.4)- What is the average marks?

1. 77 2. 80 3. 81 4. 78

Q.5)- A man buys an article for ₹80 and marks it at ₹125. He then allows a discount of 40%. What is his percentage of loss or gain?

1. 12% gain 2. 10% gain 3. 6.25% loss 4. 12% loss

Subhas, a 3.15 m tall tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Subhas and the building. The tree is located at a distance of 7.5 m from Subhas and at a distance of 45 m from the building. Further, the eyes of Subhas, the top of the tree, and the top of the building fall in one line. Find the height (in m) from the ground at which Subhas' eyes are situated.

1. 1.75 2. 1.8 3. 1.6 4. 1.5

Q.7)- The lengths of two parallel chords of a circle are 10 cm and 24 cm lie on the opposite sides of the centre. If the smaller chord is 12 cm from the centre, what is the distance (in cm) between the two chords?

1. 13 2. 5 3. 17 4. 12

Q.8)- If θ is an acute angle and $\cos \theta = \frac{39}{89}$, what is the value of $\sin \theta$?

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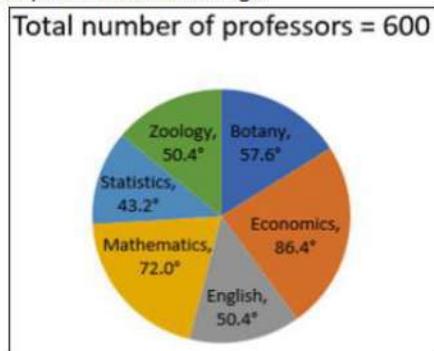
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1. $\frac{49}{89}$ 2. $\frac{79}{89}$ 3. $\frac{80}{89}$ 4. $\frac{50}{89}$

Study the given pie chart and answer the question that follows.

The pie chart shows the distribution (in terms of central angles) of the number of professors in six different departments of a college.



Q.9)- The number of professors in Economics and Mathematics is approximately (correct up to two decimal places) what per cent more than the number of professors in English and Statistics?

1. 69.23% 2. 59.09% 3. 40.91% 4. 70.91%

Q.10)- The marked price of a sunglass is ₹1,350. It is sold at ₹1,188 after allowing a certain discount. Find the rate of discount.

1. 14% 2. 12% 3. 16% 4. 10%

Q.11)- If $a + \frac{1}{a} = 5$, then determine the value of $a^3 + \frac{1}{a^2}$.

1. 90 2. 125 3. 105 4. 110

Q.12)- If $\tan \theta \cdot \tan 2\theta = 1$, then the value of $\cot 5\theta$ is:

1. -1 2. 1 3. $-\sqrt{3}$ 4. $\sqrt{3}$

Q.13)- A man sells rice at 8% profit and uses weight 25% less than the actual measure. What is his percentage profit?

1. 44% 2. 41% 3. 23% 4. 36%

Q.14)- The simple interest (in ₹, rounded off to the tens place) on ₹12,300 from 22 May 1993 to 2 August 1993 (both days are included) at the rate of 12% per annum is:

1. 300 2. 200 3. 250 4. 350

Q.15)- Two points P and Q are 3 cm apart. These two points lie on the circumference of a circle having radius 1.7 cm. What is the distance (in cm) of the line segment PQ from the centre of the circle?

1. 0.8 2. 1.0 3. 0.4 4. 0.6

Q.16)- Two people A and B started running from the same point on a circular track of length 400 m in opposite directions with initial speeds of 10 m/s and 40 m/s, respectively. Whenever they meet, A's speed doubles and B's speed halves. After what time from the start will they meet for the third time?

1. 30 sec 2. 24 sec 3. 26 sec 4. 28 sec

Two years ago, the population of the city was 5,00,000. If the annual birth rate and the annual death rate are 6% and 3%, respectively, what is the present population of the city?

- Q.17)-** 1. 536440 2. 580440 3. 530450 4. 540550

Find the value of the given expression.

Q.18)- $\left(2\frac{1}{2} \div 1\frac{7}{8}\right) \div \left(9\frac{3}{8} \div 11\frac{2}{3} \text{ of } \frac{1}{8}\right)$

1. $\frac{33}{135}$ 2. $\frac{11}{135}$ 3. $\frac{28}{135}$ 4. $\frac{57}{135}$

- Q.19)-** Find the average of prime numbers lying between 69 and 92.

1. 76 2. 77 3. 78 4. 79

In ΔABC , P and Q are the middle points of the sides AB and AC, respectively. R is point on the segment PQ such that $PR : RQ = 1 : 3$. If $PR = 6$ cm, then BC :

1. 46 cm 2. 48 cm 3. 44 cm 4. 50 cm

- Q.21)-** The diameter of a sphere is 14 cm, then the volume of this sphere is (use $\pi = 22/7$):

1. $1437\frac{1}{3} \text{ cm}^3$ 2. $1683\frac{1}{3} \text{ cm}^3$ 3. $1521\frac{2}{3} \text{ cm}^3$ 4. $2125\frac{1}{3} \text{ cm}^3$

- Q.22)-** If $x = (7 + 3\sqrt{5})$, then find the value of $x^2 + \frac{1}{x^2}$.

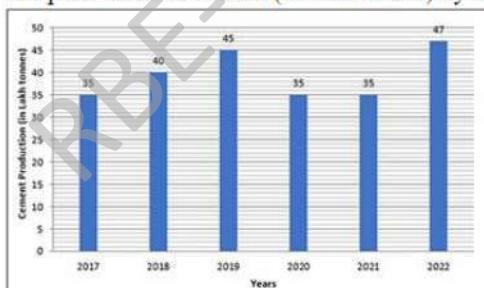
1. $\frac{580+315\sqrt{5}}{8}$ 2. $\frac{799+328\sqrt{5}}{8}$ 3. $\frac{799+315\sqrt{5}}{12}$ 4. $\frac{799+315\sqrt{5}}{8}$

A person spent 12% of his salary on groceries, 8% on medicines, 20% on children's school fee and he had a balance of ₹36,000. Find his salary.

1. ₹56,000 2. ₹54,000 3. ₹60,000 4. ₹66,000

Study the given bar graph and answer the question that follows.

The production of cement (in lakh tonnes) by a company during the last six years is presented by the bar graph.



- Q.24)-** What is the average cement production (in lakh tonnes) during the given six years?

1. 40.0 2. 39.0 3. 39.5 4. 40.5

Three people A, B and C worked together and finished a work in 9 days. If A alone can finish the same work in 18 days, B alone in 30 days, then the number of days C alone will take is:

1. 36 days 2. 45 days 3. 40 days 4. 54 days

Answer key

Q.1	2	Q.2	4	Q.3	2	Q.4	3	Q.5	3
Q.6	2	Q.7	3	Q.8	3	Q.9	1	Q.10	2
Q.11	4	Q.12	3	Q.13	1	Q.14	1	Q.15	1
Q.16	3	Q.17	3	Q.18	3	Q.19	4	Q.20	2
Q.21	1	Q.22	4	Q.23	3	Q.24	3	Q.25	2

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(Selected as GST Inspector)
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10/08/2023-> (9:00 AM - 10:00 AM)

Q.1)- If $\sin A = \frac{2}{5}$, where A is an acute angle, what is the value of $\frac{5 \sin A + 2 \operatorname{cosec} A}{\sqrt{21} \sec A}$?

1. $\frac{5}{4}$ 2. $\frac{7}{5}$ 3. $\frac{4}{5}$ 4. $\frac{5}{7}$

Q.2)- If $x^2 + \frac{1}{x^2} = 29$, then find the value of $x - \frac{1}{x}$.

1. ± 4 2. $\pm 3\sqrt{3}$ 3. $\pm 4\sqrt{3}$ 4. ± 3

Q.3)- 8 cm and 5 cm are the radii of two circles. If the distance between the centres of the two circles is 11 cm, then the length (in cm) of the common tangent of two circles is:

1. $2\sqrt{7}$ 2. $4\sqrt{7}$ 3. $3\sqrt{7}$ 4. $\sqrt{7}$

Q.4)- If $4 \sin^2 A - 3 = 0$ and $0 \leq A \leq 90^\circ$, then $3 \sin A - 4 \sin^3 A$ is:

1. 0 2. $\frac{1}{2}$ 3. $\sqrt{\frac{3}{2}}$ 4. 1

Q.5)- Find the volume of a solid sphere whose diameter is 42 cm. (Use $\pi = \frac{22}{7}$)

1. 38808 cm³ 2. 38806 cm³ 3. 38807 cm³ 4. 38805 cm³

Q.6)- Dileep purchases 90 articles for ₹13,230 and sells them at a loss equal to the selling price of 8 articles. What will be the selling price of one article?

1. ₹135 2. ₹125 3. ₹130 4. ₹120

Q.7)- In a circle with radius 20 cm, X is a point located at a distance of y cm from the centre of the circle. If the length of a tangent drawn from point X to the circle is 21 cm, find the value of y.

1. 28 2. 31 3. 25 4. 29

Q.8)- If a man completed a work in 10 days and the same work was completed by a woman in 8 days. How many days will it take to complete if they work together?

1. $\frac{40}{7}$ 2. $\frac{40}{9}$ 3. $\frac{38}{8}$ 4. $\frac{42}{9}$

Q.9)- Simplify $(3x + 2y)^2 - (3x - 2y)^2$.

1. $9x^2 - 4y^2$ 2. $24xy$ 3. $18x^2 - 8y^2$ 4. $12xy$

Q.10)- In a mixture of 178 litres, the ratio of water and milk is 5:7. How much water should be added to make the ratio of water and milk 3:4?

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1. $2\frac{23}{24}$ litres 2. $2\frac{11}{24}$ litres 3. $3\frac{17}{24}$ litres 4. $3\frac{13}{24}$ litres

Q.11)- A 45% profit is made when a discount of 45% is given on the marked price of an item. If the discount on the marked price of the same item is 50%, then the profit will be:

1. $31\frac{9}{11}\%$ 2. $30\frac{7}{11}\%$ 3. $31\frac{7}{11}\%$ 4. $33\frac{2}{11}\%$

Q.12)- A motorboat, whose speed is 20 km/h in still water takes 3 hours to cover a distance of 22.5 km upstream and then comes back to its starting point. The speed of the stream (in km/h) is:

1. 11 2. 8 3. 10 4. 9

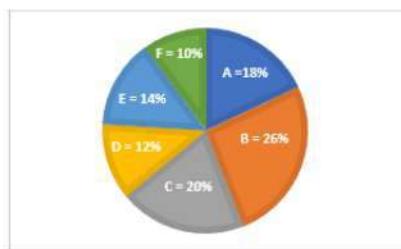
Q.13)- The mean proportion of number 0.049 and 0.9 is:

1. 0.63 2. 21 3. 0.021 4. 0.21

The Pie chart shows the percentage distributions of total number of laptops (both Dell and HP) sold by six stores in March.

Refer to the pie chart and table carefully and answer the given questions.

Total number = 11200



Ratio of the numbers of Dell and HP sold

Stores	Ratio
A	5 : 4
B	7 : 6
C	1 : 4
D	11 : 10
E	4 : 3
F	3 : 1

The number of Dell laptops sold by store B is what per cent more than that of HP laptops sold by stores E and F? (correct to two decimal places)

Q.14)-

1. 27.64% 2. 57.64% 3. 70.43% 4. 64.70%

A man invested ₹4,500 at 5% per annum and ₹5,500 at 8% per annum simple interest. Both investments were for 4 years each. The amount received from the lower rate of interest is what per cent (rounded off to the nearest integer) of the amount received from the higher rate of interest?

Q.15)-

1. 74% 2. 51% 3. 63% 4. 48%

Q.16)- The population of a village in 2019 was 30,000. The increase in population rate was 15% and 25%, respectively, from the year 2019 to 2020 and 2020 to 2021. What was the population in the year 2021?

1. 42,325 2. 42,000 3. 43,125 4. 42,523

Simplify the given expression.

Q.17)- $40 \times 7 - 2 \times (11^3 \div 11) \div 22 + 30$

1. 298 2. 299 3. 300 4. 297

A person sold two items selling each for ₹42,600. On the first item, he made a loss of 25%, while on the second, he gained 20%. Find his overall percentage gain or loss, giving your answer correct to one place of decimal.

Q.18)-

1. 8.3% loss 2. 7.7% gain 3. 7.7% loss 4. 8.2% loss

Q.19)- In a circle with centre O and diameter EF, if the two chords AE = AF, then $m\angle AEF$ is:

1. 45° 2. 80° 3. 60° 4. 90°

Table shows the annual income of 5 schools (in lakhs rupees).

SOURCE OF INCOME	SCHOOLS				
	P	Q	R	S	T
DONATION	140	250	200	300	220
TUITION FEES	280	310	340	200	200
GRANTS	110	110	120	125	130
EXAM FEES	102	104	110	120	130
MISC	160	180	190	200	250

Q.20)- Which school has the highest percentage of income from donations out of its total income?

1. R 2. Q 3. S 4. P

Q.21)- Simplify the given expression. $\frac{(80 \times 80 \times 80) + (70 \times 70 \times 70) + (50 \times 50 \times 50) - 840000}{6400 + 4900 + 2500 - 5600 - 3500 - 4000}$

1. 100 2. 300 3. 200 4. 400

M is the mid-point of side QR of a parallelogram PQRS (P being on the top left hand, followed by other points going clockwise). The line SM is drawn intersecting PQ produced at T. What is the length (in terms of the length of SR) of

Q.22)- PT?

1. $2SR$ 2. SR 3. $\frac{3SR}{2}$ 4. $\frac{SR}{2}$

If the difference between the simple interest and the compound interest for 3 years at the rate of 10% per annum on a certain sum is equal to ₹310, then that sum of money is:

1. ₹8,000 2. ₹9,500 3. ₹10,000 4. ₹12,000

Q.24)- If $\sin A = \frac{3}{5}$, calculate the value of $\cos A + \tan A - 1$.

1. $\frac{21}{20}$ 2. $\frac{11}{20}$ 3. 2 4. $\frac{13}{20}$

The production of three products by three companies is given below in the table.

Company →\Product ↓	1	2	3
A	25	35	10
B	30	15	20
C	20	20	40

Q.25)- Which of the following gives maximum production of a product by any company?

1. Product A, Company 2 2. Product B, Company 1 3. Product A, Company 3 4. Product C, Company 3

Answer key

Q.1	2	Q.2	2	Q.3	2	Q.4	1	Q.5	1
Q.6	1	Q.7	4	Q.8	2	Q.9	2	Q.10	3
Q.11	1	Q.12	3	Q.13	4	Q.14	4	Q.15	1
Q.16	3	Q.17	2	Q.18	3	Q.19	1	Q.20	3
Q.21	3	Q.22	1	Q.23	3	Q.24	2	Q.25	4

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By: Shubham Jain
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10/08/2023-> (11:45 AM - 12:45 PM)

Study the following table carefully and answer the question that follows.

State / Year	1994	1995	1996	1997	1998
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
Karnataka	750	600	830	575	900
West Bengal	500	550	450	600	525
Delhi	1500	1625	1700	1475	1800
Andhra Pradesh	800	840	875	925	785
Total	5308	5395	5955	5895	6435

Q.1)- In the case of which state/UT was there a continuous increase in the number of students over the given years?

1. Andhra Pradesh 2. Karnataka 3. West Bengal 4. Maharashtra

Lakshita purchased a sofa set at a discount of 25%. As per her calculations, she noticed that if she would have not been given this discount, she would have paid ₹22,400 more as the cost of this sofa set. How much did Lakshita pay for the sofa set?

1. ₹67,200 2. ₹22,400 3. ₹33,600 4. ₹67,000

Q.3)- If θ is an acute angle and $\sin \theta \cos \theta = 2 \cos^3 \theta - \frac{1}{4} \cos \theta$, then the value of $\sin \theta$ is:

1. $\frac{\sqrt{15}-1}{4}$ 2. $\frac{\sqrt{15}-1}{2}$ 3. $\frac{\sqrt{15}+1}{4}$ 4. $\frac{\sqrt{15}-1}{8}$

Q.4)- A man bought 13 chairs at ₹150 each and 15 chairs at ₹130 each. The average price of a chair (to the nearest rupee) is:

1. ₹145 2. ₹130 3. ₹142 4. ₹139

In a mixture, the ratio of a chemical X and water is 15 : 9. When 48 litres of this mixture is replaced with water, the ratio becomes 11 : 13. Find the quantity of water after replacement.

1. 99 litres 2. 97.5 litres 3. 92 litres 4. 102.5 litres

Q.6)- করিগুম্বা $(a+b+c)=20$ অমসূং $a^2 + b^2 + c^2 = 262$ ওইবৰদি, $ab + bc + ca$ গী ভেন্যু পুখোকড়।

1. 84 2. 72 3. 48 4. 69

Q.7)- If each side of a cube is decreased by 12%, then the percentage decrease in its surface area is:

1. 25.66% 2. 22.56% 3. 26.54% 4. 28.23%

A trader allows a discount of 5% for cash payment. What percentage above the cost price must he mark his goods to make a profit of 14%?

1. 40% 2. 20% 3. 50% 4. 30%

At a certain annual rate (rounded off to the nearest integer) of simple interest, a sum of money becomes nine times its original value in 21 years. By how much does the rate of interest change if the same sum of money has to become 12 times its original value in 25 years?

- Q.9)-**
 1. Increases by 8% 2. Decreases by 8% 3. Decreases by 6% 4. Increases by 6%

A shopkeeper earns a profit of 20% after offering a discount of 10% on the marked price of an electric mixer. What is the cost price (in ₹) of the electric mixer having marked price ₹6,500?

1. 4,825 2. 4,850 3. 4,900 4. 4,875

Find the value of the given expression.

$$\frac{\left(4\frac{1}{3} + 3\frac{1}{3} \times 1\frac{4}{5} + 3\frac{3}{4} \times \left(1\frac{1}{2} + 1\frac{1}{3}\right)\right)}{\left(\frac{5}{3} + \frac{5}{6} \times \frac{2}{3}\right)}$$

Q.11)-

1. $11\frac{3}{8}$ 2. $14\frac{3}{8}$ 3. $10\frac{1}{8}$ 4. $16\frac{5}{8}$

Q.12)- If $\tan(5\theta - 10^\circ) = \cot(5\varphi + 20^\circ)$, then the value of $\theta + \varphi$ is:

1. 16° 2. 20° 3. 18° 4. 15°

Deepak starts a business with a capital of ₹1,60,000. He incurs a loss of 10% during the first year. But he makes a profit of 5% during the second year on his remaining investment. Finally, he makes a profit of 25% on his new

Q.13)- capital during the third year. Find his total profit at the end of three years.

1. ₹29,500 2. ₹28,000 3. ₹29,000 4. ₹28,500

The following bar graph gives the details of income and expenditure of five companies A, B, C, D, E (in crores of rupees)



Q.14)- The profit percentage $\left(\frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}} \times 100\right)$ is highest for the company:

1. C 2. E 3. A 4. D

In a circle of radius 8 units, a chord of length 10 units is drawn. What is the perpendicular distance of the chord from the centre of the circle in units?

1. $\sqrt{33}$ Unit 2. $\sqrt{30}$ Unit 3. $\sqrt{35}$ Unit 4. $\sqrt{39}$ Unit

Q.16)- The value of $(\sin 45^\circ + \cos 45^\circ)$ is _____.

1. $\frac{1}{\sqrt{2}}$ 2. $\sqrt{2}$ 3. 1 4. $\frac{2}{\sqrt{2}}$

Q.17)- If $(y - \frac{1}{y}) = 8$, find the value of $(y^2 + \frac{1}{y^2})$.

1. 66 2. 64 3. 60 4. 62

Q.18)- X, Y and Z can complete a piece of work in 20, 12 and 28 days, respectively. If all work together, the approximate number of days to complete the work will be:

1. 6 2. 5 3. 4 4. 7

Q.19)- If $l + m + n = 0$, then what will be the value of $\left(\frac{l^2}{mn} + \frac{m^2}{nl} + \frac{n^2}{lm}\right)^2$?

1. 16 2. 9 3. 1 4. 4

Q.20)- A chord of length 24 cm is at a distance of 5 cm from the centre of the circle. The radius of the circle is:

1. 15 cm 2. 13 cm 3. 12 cm 4. 16 cm

Q.21)- Sanjana can row a boat at 9 km/h in the still water. It takes her twice as long to row up a certain distance as to row down the same distance in the river. What is the rate of the stream (in km/h)?

1. 1 2. 3 3. 4 4. 2

In a circle, an arc subtends an angle of 84° at the centre. If the length of the arc is 22 cm, then the radius of the circle (in cm) is equal to:

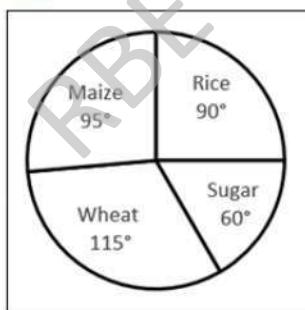
Q.22)- Take $\pi = \frac{22}{7}$

1. 19 2. 17 3. 13 4. 15

Q.23)- In triangle STU, V is a point on the side ST and W is a point on the side SU such that VWUT is a trapezium. Given that $VW : TU = 2 : 7$, what is the ratio of area of trapezium VWUT to the area of the triangle STU?

1. 49 : 81 2. 4 : 45 3. 45 : 49 4. 4 : 49

The annual agricultural production (in tonnes) of an Indian state is given in the pie chart. The total production is 12960 tonnes.



Q.24)- What is the annual production of Maize?

1. 3420 tonnes 2. 3240 tonnes 3. 4140 tonnes 4. 2160 tonnes

Q.25)- Three partners P, Q and R invest ₹1,000, ₹1,200 and ₹1,500, respectively, in a business. What should be the share of Q if the total profit is ₹666?

1. ₹284 2. ₹216 3. ₹252 4. ₹275

Answer key

Q.1	4	Q.2	1	Q.3	1	Q.4	4	Q.5	2
Q.6	4	Q.7	2	Q.8	2	Q.9	4	Q.10	4
Q.11	4	Q.12	1	Q.13	3	Q.14	4	Q.15	4
Q.16	2	Q.17	1	Q.18	1	Q.19	2	Q.20	2
Q.21	2	Q.22	4	Q.23	3	Q.24	1	Q.25	2

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10/08/2023-> (2:30 PM - 3:30 PM)

Q.1)- If one diagonal of a rhombus is equal to its side, then the diagonals of the rhombus are in the ratio of:

1. $\sqrt{2} : 1$ 2. $\sqrt{2} : \sqrt{3}$ 3. $\sqrt{3} : \sqrt{6}$ 4. $1 : \sqrt{3}$

Q.2)- Find the smallest number to be added to 1000 so that 55 divides the sum exactly.

1. 10 2. 45 3. 25 4. 35

Q.3)- If the triangles ABC and PQR are similar and if $\angle A=35^\circ$, $\angle B=65^\circ$ then $\angle R = \underline{\hspace{2cm}}$.

1. 35° 2. 65° 3. 80° 4. 90°

The chord of a circle is equal to its radius. The angle (in degrees) subtended by this chord at any point on the minor arc of the circle is:

1. 120 2. 140 3. 150 4. 130

Q.5)- At what annual rate (rounded off to the nearest integer) of simple interest will a sum of money become five times its initial value in 18 years?

1. 24% 2. 22% 3. 18% 4. 20%

Q.6)- A grocer mixes two varieties of tea priced at ₹80/kg and ₹85/kg in a certain ratio to produce a new variety priced at ₹82/kg. What is the ratio in which the two varieties were mixed to obtain the new variety?

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

Q.7)- The perimeter of a sector of a circle of radius 7.4 cm is 20.6 cm. The area of this sector is:

1. 21.46 cm^2 2. 10.73 cm^2 3. 5.8 cm^2 4. 42.92 cm^2

Study the given pie chart and answer the question that follows.

Ravi decides to renovate his old house. His percentage expenditure on different renovating items is given by the pie chart.



Q.8)- Ravi gets a discount of 10% and 8% on the cash payment for Furniture and Electric items, respectively. What is the total amount (in ₹) paid by him for Furniture and Electric items?

1. 30,200 2. 28,000 3. 56,000 4. 58,200

A rides his bicycle at 15 km/h, while B starts his ride after 6 hours to catch A with a speed of 25 km/h. Time taken by B to catch A (in hours) is:

- Q.9)-
1. 6 2. 9 3. 8 4. 10

△RMS is right-angled at M. The length of the base, RM = 4 cm and the length of perpendicular MS = 3 cm. Find the value of sec R.

1. $\frac{4}{5}$ 2. $\frac{5}{4}$ 3. $\frac{3}{4}$ 4. $\frac{2}{5}$

The sides of a triangle are 20 cm, 21 cm and 29 cm. The area of the triangle formed by joining the mid points of the sides of triangle will be:

- Q.10)-
1. $58\frac{1}{3} \text{ cm}^2$ 2. $47\frac{1}{2} \text{ cm}^2$ 3. $67\frac{2}{3} \text{ cm}^2$ 4. $52\frac{1}{2} \text{ cm}^2$

The cost of 12 apples and 15 oranges is ₹660. The cost of 15 apples and 21 oranges is ₹870. Find the cost of one apple.

- Q.12)-
1. ₹15 2. ₹30 3. ₹25 4. ₹20

The following table shows the heights of six students. Study the table carefully and answer the following question.

Name	Height (in cm)
Vanaja	117
Sailaja	125
Uma	133
Sudha	140
Amala	132
Leela	121

Q.13)- How many students are there whose height is between that of Vanaja and Uma?

1. Three 2. Four 3. One 4. Two

Q.14)- A, B and C started a business by investing ₹9,000, ₹18,000 and ₹21,000, respectively. If B's share in the profit earned by them is ₹759, then the total profit earned by them together is:

1. ₹2,024 2. ₹2,504 3. ₹2,208 4. ₹2,808

Q.15)- George can do 35% of the total work in 6 days. Jim and George together completed a piece of work in 12 days. In how many days could Jim, working alone, complete the entire task?

1. 40 2. 45 3. 42 4. 36

Q.16)- If $x^2 - \sqrt{9.76}x + 1 = 0$ and $x > 1$, the value of $\left(x^3 - \frac{1}{x^2}\right)$ is:

1. 24.024 2. 21.042 3. 21.024 4. 24.042

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The following table gives the sales of TVs of different brands over the years (numbers in thousands).

Year	TV Brands			
	Brand 1	Brand 2	Brand 3	Brand 4
2015	80	150	116	112
2016	84	130	108	70
2017	98	124	80	110
2018	110	100	160	95
2019	196	180	159	190
2020	124	70	174	54
2021	128	90	180	150

Q.17)- Which TV brand is the highest sold in the year 2019?

1. Brand 1
2. Brand 4
3. Brand 3
4. Brand 2

Q.18)- If $2x + 5y = 15$ and $xy = 6$, then the value of $4x^2 + 25y^2$ is _____.

1. 105
2. 90
3. 100
4. 95

A blended tea in a barrel contains Assam, Darjeeling and Nilgiri Hills in the ratio 2 : 3 : 1. Another barrel contains Darjeeling, Nilgiri Hills and Kangra Valley in the ratio 5 : 4 : 3. If equal weights of both blended tea mix together to make a new brand, then the weight of Kangra Valley per kilogram in the new brand is:

- Q.19)-**
 1. 500 gm
 2. 100 gm
 3. 250 gm
 4. 125 gm

What is the difference between the compound interest on ₹6,400 for 1 year at 5% per annum compounded yearly and half-yearly?

- Q.20)-**
 1. ₹8
 2. ₹4
 3. ₹7
 4. ₹9

Q.21)- A number first increased by 8% and then decreased by 3% to get 2619. What is 5% of that number?

1. 125
2. 130
3. 140
4. 135

Q.22)- If $A = 60^\circ$ and $B = 30^\circ$, find the value of $\frac{(\tan A - \tan B)}{(1 + \tan A \tan B)}$.

1. 3
2. $\sqrt{3}$
3. $\frac{1}{\sqrt{3}}$
4. 1

Q.23)- Evaluate the given expression: $\cos^2 36^\circ + \cos 54^\circ \cdot \sin 36^\circ + \left(\frac{\tan 26^\circ}{\cot 64^\circ}\right)$

1. 2
2. 4
3. 1
4. 3

Q.24)- A manufacturer marked an item at ₹75 and sold it allowing a 14% discount. If his profit was 29%, then the cost price (in ₹) of the item was:

1. 64
2. 57
3. 50
4. 45

Q.25)- What is a single discount equivalent to the three successive discounts of 20%, 25% and 20%?

1. 52%
2. 42%
3. 58%
4. 38%

Answer key

Q.1	4	Q.2	2	Q.3	3	Q.4	3	Q.5	2
Q.6	3	Q.7	1	Q.8	4	Q.9	2	Q.10	2
Q.11	4	Q.12	2	Q.13	1	Q.14	1	Q.15	1
Q.16	3	Q.17	1	Q.18	1	Q.19	4	Q.20	2
Q.21	1	Q.22	3	Q.23	1	Q.24	3	Q.25	1

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10/08/2023-> (5:15 PM - 6:15 PM)

Q.1)- If $\left(5a + \frac{4}{a} - 2\right) = 13$ and $a > 0$, what is the value of $\left(25a^2 + \frac{16}{a^2}\right)$?

1. 185 2. 175 3. 158 4. 157

Simplify the given expression.

$$\frac{(x^2-y^2)(x+y)}{x^2+xy+y^2}$$

1. $x^2 - y^2$ 2. $x+y$ 3. $x^2 + y^2$ 4. $x-y$

A hemispherical dome of a building needs to be painted. If the circumference of the base of the dome is 154 cm, then

Q.3)- find the cost of painting it if the cost of painting is ₹4 per 100 cm² (use $\pi = \frac{22}{7}$).

1. ₹105.29 2. ₹105.66 3. ₹150.66 4. ₹150.92

Q.4)- If $a+5b=13$ and $ab=9$, find the value of $a^2 + 25b^2$.

1. 69 2. 79 3. 59 4. 49

Q.5)- A bookseller gives 7 books free on buying 13 books. Find the percentage of discount given to the customer's.

1. 35% 2. 25% 3. 20% 4. 30%

Q.6)- A shopkeeper marks his goods at 90% more than their cost price and allows a discount of 40% on the marked price. His gain percentage is:

1. 12% 2. 16% 3. 18% 4. 14%

Q.7)- Two similar triangles are given i.e. $\Delta LMN \sim \Delta PQR$, with measurement of angle and side as angle $L = 40^\circ$, angle $N = 80^\circ$, $LM = 6$ cm, $LN = 8$ cm and $PQ = 7.5$ cm. Find the value of angle Q and side PR , respectively.

1. $60^\circ, 20$ cm 2. $50^\circ, 6.5$ cm 3. $40^\circ, 10$ cm 4. $60^\circ, 10$ cm

Q.8)- In a 140 m race, Pankaj runs at a speed of $\frac{5}{2}$ m/s. He gives a start of 20 m to Arun and still defeats him by 4 seconds. The speed of Arun is:

1. 1.5 m/s 2. 1.25 m/s 3. 2 m/s 4. 1.75 m/s

Find the value of the following expression.

Q.9)- $2(\tan^2 A \cos^2 A + \cos^2 A)$

1. 3 2. 2 3. 1 4. 4

Study the given table and answer the question that follows.
The table shows the total score scored by 8 batsmen in the year 2022.

Batsman	A	B	C	D	E	F	G	H
Total Score	1356	1301	1278	1156	1380	1281	1129	1365

Q.10)- Who is the second-highest scorer in the year 2022?

1. B 2. H 3. E 4. A

Q.11)- In what time will ₹3,20,000 amount to ₹4,05,000 if compounded at 12.5% per annum?

1. 3 years 2. 4 years 3. 2 years 4. 1 year

Q.12)- A can finish a work in 24 days and B in 30 days, individually. They work together for 11 days. The percentage of the work still to be finished will be:

1. 12.5% 2. 16% 3. 17.5% 4. 18%

Rice worth ₹504 per kg and ₹540 per kg are mixed with the third variety in the ratio 1 : 1 : 2. If the mixture is worth ₹612 per kg, find the price (per kg in ₹) of the third variety.

1. 522 2. 702 3. 630 4. 764

Q.14)- In a triangle ABC; $8\angle A = 6\angle B = 3\angle C$. What are the degree measures of $\angle A$, $\angle B$ and $\angle C$?

1. $36^\circ, 96^\circ, 48^\circ$ 2. $36^\circ, 48^\circ, 96^\circ$ 3. $48^\circ, 96^\circ, 36^\circ$ 4. $96^\circ, 48^\circ, 36^\circ$

If two circles of different radii touch externally, then what is the maximum number of common tangents that can be drawn to the two circles?

1. 3 2. 0 3. 2 4. 1

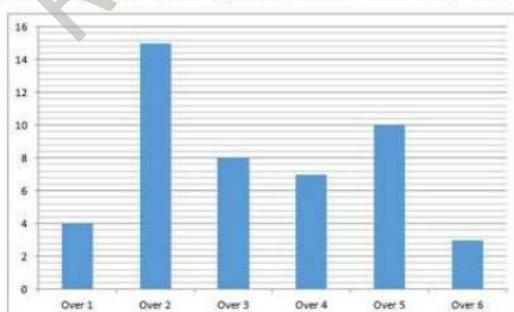
Two circles of radius 2.4 cm and 4 cm, respectively, have a common tangent. The distance between the centres of the two circles is 6.5 cm. If the common tangent does not intersect the line joining the centres, then find the length of a common tangent to the circles.

1. 6.3 cm 2. 6.1 cm 3. 6.2 cm 4. 6.0 cm

Q.17)- A sells a television to B for ₹4,860, thereby losing 19%. B sells it to C at a price which would have given A a 17% profit. Find the gain of B.

1. ₹2,160 2. ₹4,160 3. ₹1,160 4. ₹3,160

The bar graph below gives the runs scored by Team A in the first six overs of a cricket match.



The runs scored by Team A in the 7th over was 5 more than the runs scored by them in the 8th over, but 6 less than the runs scored by them in the 9th over. If the average runs scored per over by Team A in the first nine overs of the match was 9, how many runs did the team score in the 8th over?

1. 5 2. 7 3. 6 4. 8

Study the table given below and answer the question.

The table shows the number of Athletes who participated in sports event from 4 different countries over the years.

Country ⇒	India		England		France		Australia	
	Male	Female	Male	Female	Male	Female	Male	Female
2016	460	180	740	480	480	280	320	100
2017	430	330	630	420	840	120	220	80
2018	200	150	400	130	350	160	100	90
2019	360	120	550	250	900	600	600	300

What is the ratio of the average number of female athletes who participated from England over all the years together to the average number of female athletes who participated from France over all the years together?

Q.19)-

1. 45 : 49 2. 32 : 29 3. 49 : 32 4. 57 : 32

Q.20)-

If A, B, C are the acute angles, such that $\tan(A + B - C) = \frac{1}{\sqrt{3}}$, $\cos(B + C - A) = \frac{1}{2}$, and $\sin(C + A - B) = \frac{1}{\sqrt{2}}$. The value of A + B + C will be equal to:

1. 90° 2. 110° 3. 135° 4. 170°

Q.21)-

An amount of ₹P was put at simple interest at a certain rate for 4 years. If it had been put at a 6% higher rate for the same period, it would have fetched ₹600 more interest. What is the value of 2.5 P?

Q.22)-

Two candidates A and B contested in an election. 80% of the voters cast their votes, out of which 2% of the votes were invalid. A got 9,408 votes which was 60% of the valid votes. Find the total number of votes.

1. 22,000 2. 21,000 3. 20,000 4. 12,000

Q.23)-

What is the value of x in the number 3426x if the number is divisible by 6 but NOT divisible by 5?

1. 8 2. 4 3. 3 4. 6

Q.24)-

When P is subtracted from each of the numbers 8, 6, 2 and 9, the numbers so obtained in this order are in proportion.

What is the mean proportional between $(3P - 6)$ and $(9P - 4)$?

1. 29 2. 28 3. 24 4. 26

Find the value of the following expression.

Q.25)-

$$\frac{(1 + \sec\theta)}{\sec\theta} (1 - \cos\theta)$$

1. $\sin^2\theta$ 2. $\cos^2\theta$ 3. $\cot^2\theta$ 4. $\sec^2\theta$

Answer key

Q.1	1	Q.2	1	Q.3	4	Q.4	2	Q.5	1
Q.6	4	Q.7	4	Q.8	3	Q.9	2	Q.10	2
Q.11	3	Q.12	3	Q.13	2	Q.14	2	Q.15	1
Q.16	1	Q.17	1	Q.18	3	Q.19	2	Q.20	3
Q.21	3	Q.22	3	Q.23	4	Q.24	2	Q.25	1



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By: Shubham Jain
(Selected as GST Inspector)
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11/08/2023-> (9:00 AM - 10:00 AM)

Rohita offers a discount of 20% on the marked price of an object. Due to recession of market, she further offers a discount of 30% on its sale. What is the equivalent single discount percentage corresponding to these two successive discounts offers?

- Q.1)-
1. 44% 2. 42% 3. 40% 4. 56%

Q.2)- Simplify $\frac{36a^2 - 49b^2}{6a + 7b}$.

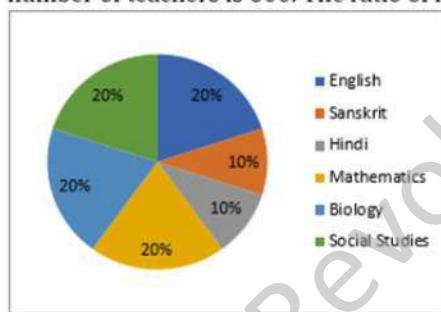
1. $6a - 7b$ 2. $\frac{1}{6a - 7b}$ 3. $6a + 7b$ 4. $7b - 6a$

Q.3)- If $(3y + \frac{3}{y}) = 8$, find the value of $(y^2 + \frac{1}{y^2})$.

1. $7\frac{1}{9}$ 2. $4\frac{5}{6}$ 3. $9\frac{1}{9}$ 4. $5\frac{1}{9}$

Study the given pie-chart and answer the question that follows.

Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male and female teachers is 3 : 1.



- Q.4)- Find the total number of teachers in Mathematics, Biology and Social Studies.

1. 400 2. 320 3. 420 4. 360

The ratio of the father's age to his son's age is 5 : 3. The product of the numbers representing their ages is 960.

- Q.5)- The ratio of their ages after 6 years will be:

1. 21 : 15 2. 21 : 17 3. 23 : 17 4. 23 : 15

- Q.6)- If four-fifths of five-sixths of one-eighth of a certain number is 4365, what is 65% of the number?

1. 36,375 2. 53,280 3. 34,047 4. 52,380

- Q.7)- Find the least value for * in the number 3*7440 such that it is divisible by 12.

1. 2 2. 1 3. 0 4. 4

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The population of a city was 12,50,000 in the year 2010. It increased at the rate of 2% per annum during the years 2011 and 2012. In the year 2013, it decreased by 1%. Find the population of the city at the end of 2013.

- Q.8)-** 1. 13,50,000 2. 12,87,495 3. 1,28,54,952 4. 13,87,495

Q.9)- Let ABC be a right-angled triangle where $\angle A = 90^\circ$ and $\angle C = 45^\circ$. Find the value of $\sec C + \sin C \sec C$.

1. 1 2. $1 - \sqrt{2}$ 3. $1 + \sqrt{2}$ 4. $\sqrt{2} - 1$

A man invested ₹4,400 at 10% and ₹7,500 at 8% simple interest. What amount (in ₹) will he get from his investments

Q.10)- after 12 years?

1. 24,380 2. 24,830 3. 28,840 4. 28,380

Q.11)- The distance between two parallel chords of length 6 cm each, in a circle of diameter 10 cm is:

1. 6 cm 2. 8 cm 3. 4 cm 4. 12 cm

Following table shows the details of students, from universities A, B, C about Applied (App), Qualified (Qual), selected (sel) in various competitive examinations:

Year	University A			University B			University C		
	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel
2016	6500	1000	190	7500	720	182	6800	900	178
2017	5000	450	148	8400	900	114	5500	830	185
2018	8000	1200	128	6500	600	128	6000	500	148
2019	10000	1800	190	7200	1000	155	7500	750	154
2020	8500	1500	170	9000	1200	110	9000	1000	180

Q.12)- The percentage of students qualified over the applied number of students, from University B, is highest in the year:

1. 2019 2. 2018 3. 2020 4. 2016

A shopkeeper does a faulty weighing of an item of 930 gram instead of 1 kg and sells it at its cost price. Find his profit percentage on selling 15 kg of the item.

1. $7\frac{49}{93}\%$ 2. $6\frac{19}{93}\%$ 3. $8\frac{79}{93}\%$ 4. $5\frac{21}{93}\%$

Q.14)- If $(4 \sin \theta + 5 \cos \theta) = 3$, then the value of $(4 \cos \theta - 5 \sin \theta)$ is:

1. $4\sqrt{2}$ 2. $2\sqrt{5}$ 3. $3\sqrt{2}$ 4. $2\sqrt{3}$

The cost price of an article is 72% of the marked price. The profit percentage after allowing a discount of 6% on the marked price is (rounded off to 2 decimal places):

1. 32.50% 2. 30.56% 3. 35.65% 4. 28.23%

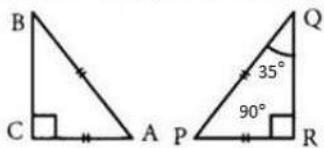
30 women working 5 hours a day can complete a work in 18 days. In how many days will 21 women working 8 hours a day complete the same work?

1. $17\frac{11}{13}$ days 2. $18\frac{7}{13}$ days 3. $16\frac{1}{14}$ days 4. $13\frac{3}{14}$ days

Q.17)- The angle subtended by an arc at the circumference of the circle is 55° . Find the angle subtended by it at the centre.

1. 110° 2. 35° 3. 125° 4. 27.5°

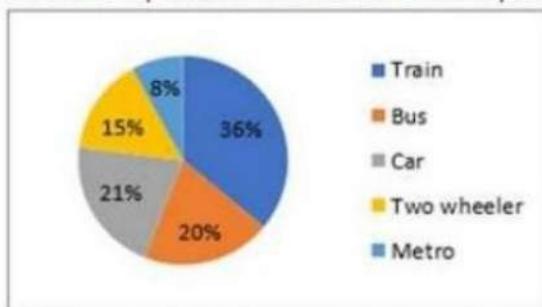
If $\triangle ABC \cong \triangle PQR$, then the value of $\angle A$ is:



Q.18)-

1. 90° 2. 45° 3. 35° 4. 55°

Pie chart represents the modes of transport used by different employees in a university.



Q.19)- The number of employees who use the bus if there are total of 150 employees is:

1. 30 2. 25 3. 20 4. 18

Q.20)- The perimeter of a minor sector of a circle of radius 5 cm is 15.5 cm. Find the area of the minor sector (use $\pi = \frac{22}{7}$).

1. 17.53 cm^2 2. 17.35 cm^2 3. 13.75 cm^2 4. 13.57 cm^2

The sum of the cubes of two given numbers is 10234, while the sum of the two given numbers is 34. What is the positive difference between the cubes of the two given numbers?

1. 8602 2. 3484 3. 3488 4. 3356

Q.22)- The average weight of a class of 30 students is 45 kg. One of the students whose weight is 48.5 kg is replaced by another student and the average weight was increased by 200 g. Find the weight of the new student.

1. 50 kg 2. 54.5 kg 3. 51 kg 4. 55 kg

Q.23)- If $\text{Cosec } \theta - \cot \theta = \frac{7}{2}$, then the value of $\text{Cosec } \theta$ will be:

1. $\frac{49}{28}$ 2. $\frac{47}{28}$ 3. $\frac{53}{28}$ 4. $\frac{21}{28}$

Two cities P and Q are 181 km apart on a straight road. One man starts from P at 8:30 A.M. and travels toward Q at 30 km/h. If another man starts from Q at 8:54 A.M. and travels towards P at a speed of 35 km/h, then at what time will they meet?

1. 10:30 A.M. 2. 11:00 A.M. 3. 10:00 A.M. 4. 11:30 A.M.

Q.25)- The total surface area of a solid hemisphere of diameter 14 cm is (use $\pi = \frac{22}{7}$):

1. 522 cm^2 2. 584 cm^2 3. 428 cm^2 4. 462 cm^2

Answer key

Q.1	1	Q.2	1	Q.3	4	Q.4	4	Q.5	4
Q.6	3	Q.7	3	Q.8	2	Q.9	3	Q.10	1
Q.11	2	Q.12	1	Q.13	1	Q.14	1	Q.15	2
Q.16	3	Q.17	1	Q.18	4	Q.19	1	Q.20	3
Q.21	2	Q.22	2	Q.23	3	Q.24	4	Q.25	4

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11/08/2023-> (11:45 AM - 12:45 PM)

O is the centre of a circle with a diameter of 16 cm. Q is a point outside the circle and QS is tangent to the circle at point S. If OQ is = 17 cm, what is the length (in cm) of the tangent QS?

- Q.1)-
1. 10 2. 18 3. 15 4. 12

Q.2)- $\triangle ABC$ is an isosceles triangle with angle $ABC = 90^\circ$ and $AB = BC$. If $AC = 12\text{ cm}$, then the length of BC (in cm) is equal to:

1. $6\sqrt{2}$ 2. $8\sqrt{2}$ 3. 6 4. 8

Q.3)- A can do a work in 18 days and B in 24 days. If they work on it together for 5 days, then find the fraction of the work which is left.

1. $\frac{35}{72}$ 2. $\frac{37}{72}$ 3. $\frac{7}{72}$ 4. $\frac{33}{72}$

Q.4)- If $\sec \theta + \tan \theta = 5$, then $\sin \theta = \underline{\hspace{2cm}}$.

1. $\frac{12}{13}$ 2. $\frac{13}{12}$ 3. $\frac{1}{5}$ 4. 0

Q.5)- A shopkeeper publishes a list of prices which are 60% above the CP. He proposes to give 20% discount. How much profit does he really make?

1. 28% 2. 18% 3. 35% 4. 22%

Q.6)- Ranjeet buys 1 kg potato for ₹20 and sells it for ₹25. He also uses a weight of 800 gm in place of 1 kg. What is Ranjeet's actual profit percentage on the sale of 1 kg potato?

1. 57.25% 2. 56.25% 3. 55.75% 4. 56.75%

Q.7)- If $\tan(90^\circ - \theta) = \frac{2}{\sqrt{3}}$, then the value of $2\sqrt{3} \tan \theta + 1$ is:

1. 6 2. 3 3. 4 4. 5

Given below is the observed data of the age of various boys. Study the table carefully and answer the question that follows.

Age in years	Number of children (Boys)
5	8
6	3
7	7
8	2
9	20

Q.8)- Calculate the mean age of the boys.

Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

https://t.me/RBE_S

YouTube (Free lectures and job updates): <https://www.youtube.com/c/RBERevolutionByEducation>

1. 6.57 2. 8.57 3. 7.57 4. 9.57

Directions: The following table gives the production of cookers by four plants of a company over the five years. Study the table and answer the questions that follow.

Year	Production (in thousands)			
	Plant 1	Plant 2	Plant 3	Plant 4
2018	35	25	40	45
2019	43	44	44	40
2020	48	39	36	30
2021	32	40	35	48
2022	42	44	30	42

Q.9)- Which plant had the maximum average production in these five years?

1. Plant 1 2. Plant 2 3. Plant 3 4. Plant 4

Simplify:

$$\frac{(379 + 276)^2 + (379 - 276)^2}{379 \times 379 + 276 \times 276}$$

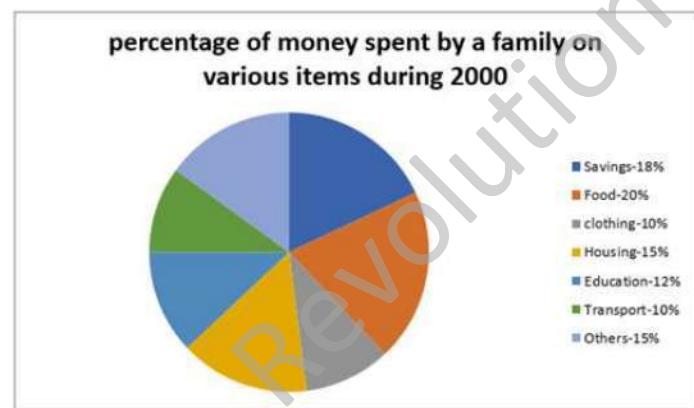
Q.10)-

1. 2 2. 655 3. 103 4. 1

Q.11)- Find the third proportion of P and 12, when 8, P, 16 and 18 are in proportion.

1. 12 2. 8 3. 18 4. 16

The pie chart given here shows the spending by a family on various items during the year 2000. Study the graph and answer these questions.



Q.12)- The ratio of the total amount of money spent on housing to that spent on education was:

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

Q.13)- What is the value of p , if, $25(4 + 3p) \div 5 - 3 \times 8 = 26$?

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

Q.14)- If $(a + b + c) = 17$, and $(a^2 + b^2 + c^2) = 115$, find the value of $(a + b)^2 + (b + c)^2 + (c + a)^2$.

1. 402 2. 404 3. 408 4. 394

Simplify:

Q.15)- $(2a - 3b - c)^2 - (a + 2b + c)^2$

1. $3a^2 + 5b^2 - 16ab - 6ac$ 2. $3a^2 + 5b^2 - 16ab + 2bc - 8ac$ 3. $3a^2 + 5b^2 - 16ab + 2bc - 6ac$ 4. $3a^2 + 5b^2 - 8ab + 2bc - 6ac$

Upon selling an article at $\frac{3}{7}$ of the marked price, a loss of 30% is incurred. What is the ratio between the marked price and the cost price of the article?

- Q.16)-** 1. 49 : 30 2. 50 : 80 3. 25 : 37 4. 48 : 60

10th class of 40 students took a Maths test. 25 students had an average score of 60. The other students had an average score of 80. What is the average score of the whole class?

- Q.17)-** 1. 65.5 2. 68.5 3. 66.5 4. 67.5

Q.18)- Find the third proportional to 8 and 20.

1. 64 2. 50 3. 25 4. 40

In ΔABC , $\overline{BD} \perp \overline{AC}$, intersecting \overline{AC} at D. Also, $BD = 12$ cm. If $m(\overline{AD}) = 6$ cm and $m(\overline{CD}) = 4$ cm, find the area (in cm^2) of ΔABC .

- Q.19)-** 1. 75 2. 50 3. 45 4. 60

A copper wire is bent in the form of a square and it encloses an area of 30.25 cm^2 . If the same wire is bent to form a circle, then find the area of the circle.

Q.20)- [Use $\pi = \frac{22}{7}$.]

1. 30.25 cm^2 2. 38.50 cm^2 3. 35 cm^2 4. 42.25 cm^2

In one hour, a boat goes 12 km along the stream and 8 km against the stream. What is the speed of the boat in still water (in km/h)?

- Q.21)-** 1. 10 2. 8 3. 12 4. 9

How many kilograms of rice costing ₹52 per kg must be mixed with 35 kg of rice costing ₹45 per kg so as to get a gain of 10% by selling the resulting mixture of rice at the rate of ₹55 per kg?

- Q.22)-** 1. 82.5kg 2. 90.0kg 3. 85.0kg 4. 87.5kg

A deposited ₹1,56,250 at 8% simple interest for 2 years. How much more money will A have in his account at the end of two years, if at the same rate of interest the sum is invested in compound interest, compounded annually

- Q.23)-** 1. ₹1,540.40 2. ₹1,000 3. ₹2,000 4. ₹1,740.90

In an isosceles right-angled triangle, the perimeter is 30 m. Find its area (in m^2). (Rounded off to the nearest integral value)

- Q.24)-** 1. 39 2. 34 3. 41 4. 36

Q.25)- If $\tan 2\theta = \cot (\theta - 36^\circ)$, where 2θ is an acute angle, then the value of θ is:

1. 18° 2. 30° 3. 36° 4. 42°

Q.1	3	Q.2	1	Q.3	2	Q.4	1	Q.5	1
Q.6	2	Q.7	3	Q.8	3	Q.9	4	Q.10	1
Q.11	4	Q.12	2	Q.13	2	Q.14	2	Q.15	3
Q.16	1	Q.17	4	Q.18	2	Q.19	4	Q.20	2
Q.21	1	Q.22	4	Q.23	2	Q.24	1	Q.25	4



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11/08/2023-> (2:30 PM - 3:30 PM)

The total number of workers in a company is 960. If the number of female workers in the company is 420, then Q.1)- the respective ratio of the total number of male workers to the total number of female workers in the company is:

1. 16 : 9 2. 9 : 7 3. 7 : 9 4. 16 : 7

A shopkeeper allows a 10% trade discount and a 10% cash discount. If the marked price is ₹1,000, then the Q.2)- selling price is:

1. ₹810 2. ₹850 3. ₹900 4. ₹920

If the radii of two circles are 7 cm and 4 cm and the length of the transverse common tangent is 13 cm, then the Q.3)- distance between the two centres is:

1. $\sqrt{128}$ cm 2. $\sqrt{290}$ cm 3. $\sqrt{190}$ cm 4. $\sqrt{240}$ cm

Q.4)- If $x^2 + y^2 + z^2 = 2(x + z - 1)$, then the value of $x^3 + y^3 + z^3$ is equal to:

1. 2 2. 6 3. 1 4. 8

The table given below shows the production of bikes by a company during the second half of 2021.

Month Type	July	August	September	October	November	December
P	58	38	56	15	45	33
Q	89	46	45	26	36	40
R	54	64	76	80	54	41
S	72	53	65	37	21	44

Q.5)- In which month was the production of all types of bikes the lowest?

1. November 2. October 3. December 4. September

A sold an item to B at a gain of 25% and B sold it to C at a loss of 10%. If C paid ₹6,520 for it, then the cost price of the Q.6)- item for A was:

1. ₹4,785 $\frac{4}{9}$ 2. ₹6,125 $\frac{1}{9}$ 3. ₹5,795 $\frac{5}{9}$ 4. ₹4,355 $\frac{4}{9}$

Brijesh can complete a work in 4 days, Ashish in 5 days, and Anand in 10 days. What will be the time taken by Brijesh, Q.7)- Ashish, and Anand to complete the work together?

1. 2 days 2. $2\frac{9}{11}$ days 3. 1 day 4. $1\frac{9}{11}$ days

Q.8)- If $4x^2 + y^2 = 40$ and $xy = 6$, then the value of $2x - y$ is:

1. 4 2. 1 3. 2 4. 3

The following table gives the distribution of respondents' level of I.Q.

IQ'	Percent
Extremely High	03.4
High	12.6
Moderate	67.1
Low	13.0
Very Low	03.9

The ratio of the number of respondents lies in high to the number of respondents lies in low is (if the total number of respondents is 208):

- Q.9)-** 1. 63 : 65 2. 45 : 31 3. 27 : 26 4. 53 : 44

- Q.10)-** If $x^2 - 3.2x + 1 = 0$ and $x > 1$, the value of $\left(x^2 - \frac{1}{x^2}\right)$ is:

1. $16.8\sqrt{0.32}$ 2. $12.8\sqrt{0.39}$ 3. $16.8\sqrt{0.39}$ 4. $12.8\sqrt{0.32}$

- Q.11)-** The area of a sector of a circle that subtends a 22.5° angle at the centre is given as 346.5 cm^2 . What will be the radius (in cm) of the circle? [Use $\pi = \frac{22}{7}$]

1. 45 2. 35 3. 42 4. 48

- Q.12)-** Let ABC be a triangle right angled at B. If $\tan A = \frac{12}{5}$, then find the values of cosec A and sec A, respectively.

1. $\frac{12}{13}, \frac{5}{13}$ 2. $\frac{13}{12}, \frac{13}{5}$ 3. $\frac{13}{10}, \frac{5}{13}$ 4. $\frac{10}{13}, \frac{5}{13}$

- Q.13)-** The population of a city increases compounded by 10% annually. The present population of this city is 1,33,100. What was the population of the city 2 years ago?

1. 1,01,000 2. 1,10,000 3. 1,00,000 4. 1,21,000

- Q.14)-** The radius and slant height of a cone are in the ratio 5 : 7. If its curved surface area is 1347.5 cm^2 , find its radius. (Use $\pi = \frac{22}{7}$)

1. 17.5 cm 2. 15 cm 3. 21 cm 4. 25.5 cm

- Q.15)-** A merchant increases the cost price of an item by 30% and offers a discount of 15% on this marked price. What is his profit percentage?

1. 11.4% 2. 8.2% 3. 10.5% 4. 9.5%

- Q.16)-** A dealer offers a discount of 10% on the marked price of an article and still makes a profit of 20%. If the cost price of the article is ₹540, then find the marked price (in ₹) of the article.

1. 720 2. 750 3. 810 4. 690

- Q.17)-** A sum of ₹12,000 amounts to ₹15,000 in 5 years at the rate of simple interest. What is the rate of interest per annum?

1. 5% 2. 6% 3. 7% 4. 8%

- Q.18)-** It is given that $\triangle PQR \cong \triangle MNY$ and $PQ = 8 \text{ cm}$, $\angle Q = 55^\circ$ and $\angle P = 72^\circ$. Which of the following is true?

1. $NM = 8 \text{ cm}$, $\angle Y = 53^\circ$ 2. $NY = 8 \text{ cm}$, $\angle Y = 72^\circ$ 3. $NM = 8 \text{ cm}$, $\angle M = 53^\circ$ 4. $NY = 8 \text{ cm}$, $\angle N = 55^\circ$

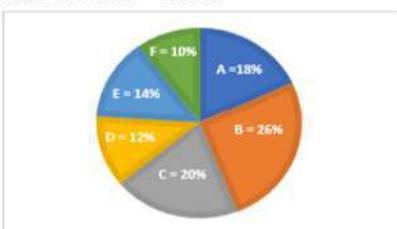
Q.19)- How much time (in minutes) will Nikhil take to cover 600 m, if he runs at a speed of 24 km/h?

1. 2.0 2. 2.5 3. 1.5 4. 1.0

Refer to the pie chart and table carefully and answer the given questions.

The Pie chart shows the percentage distributions of total number of laptops (both Dell and HP) sold by six stores in March.

Total number = 11200



Ratio of the numbers of Dell and HP sold	
Stores	Ratio
A	5 : 4
B	7 : 6
C	1 : 4
D	11 : 10
E	4 : 3
F	3 : 1

Q.20)- What is the average of Dell laptops sold by stores A, C, D and E together?

1. 792 2. 280 3. 896 4. 448

Q.21)- If $\cos\theta - \sin\theta = 0$, then $(\sin^8\theta + \cos^8\theta)$ is:

1. $\frac{1}{8}$ 2. $\frac{1}{6}$ 3. $\frac{1}{2}$ 4. $\frac{1}{4}$

Q.22)- If $\sin\theta = \frac{6}{10}$ and $\cos\theta = \frac{8}{10}$, then $\sin 2\theta = \underline{\hspace{2cm}}$.

1. $\frac{16}{10}$ 2. $\frac{24}{25}$ 3. $\frac{10}{8}$ 4. $\frac{12}{10}$

The lengths of the two sides adjacent to the right angle of a right-angled triangle are 1.6 cm and 6.3 cm. Find the length of the hypotenuse.

1. 6.7 cm 2. 7 cm 3. 7.5 cm 4. 6.5 cm

In an experiment, it was observed that metal A is 19 times heavier than water and metal B is 9 times heavier than water. In what ratio metal A and B mixed so that the mixture thus obtained be 15 times heavier than water?

1. 3 : 1 2. 1 : 3 3. 3 : 2 4. 2 : 3

The total distance in a journey is 750 km. A bus travels the first 200 km at a speed of 40 kmph. Find the speed of the bus (in kmph) for the next 550 km such that the average speed of the bus is 50 kmph.

1. 60 2. 55 3. 45 4. 40

Q.1	2	Q.2	1	Q.3	2	Q.4	1	Q.5	1
Q.6	3	Q.7	4	Q.8	1	Q.9	1	Q.10	2
Q.11	3	Q.12	2	Q.13	2	Q.14	1	Q.15	3
Q.16	1	Q.17	1	Q.18	1	Q.19	3	Q.20	1
Q.21	1	Q.22	2	Q.23	4	Q.24	3	Q.25	2



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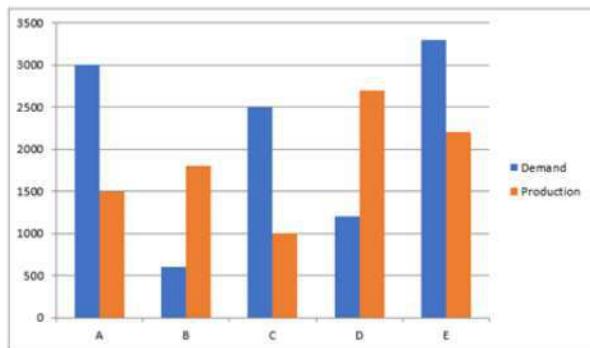
By: Shubham Jain
(Selected as GST Inspector)

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11/08/2023-> (5:15 PM - 6:15 PM)

Study the following graph carefully and answer the questions given below it.



Q.1)- The demand for company B is approximately what per cent of the demand for company C?

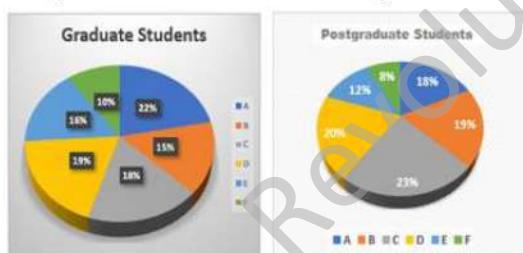
1. 25%
2. 24%
3. 23%
4. 20%

Q.2)- If $a - b = 9$ and $ab = 20$, then $a^2 + b^2$:

1. 121
2. 111
3. 115
4. 118

Study the given pie-charts and answer the question that follows.

The pie-charts show the details of graduate and post graduate students of the Universities A, B, C, D, E, F.



If the total number of graduates across all universities is 24,800 and that of postgraduates is 18,400, then the ratio of the graduates in the universities A and E together to the postgraduates in the universities B and C will be:

1. 589 : 483
2. 249 : 131
3. 358 : 249
4. 128 : 269

Q.4)- If $x + \frac{1}{x} = 2$, then the value of $x^{11} + \frac{1}{x^{20}}$ is:

1. 1
2. 0
3. 7
4. 2

A chord is drawn in a circle of radius 10 cm, if the distance of the chord from the centre is 6 cm, then the length of the chord (in cm) is:

1. 16
2. 12
3. 8
4. 10

Q.6)- If θ is an acute angle and $\sin\theta = \frac{21}{25}$, then what is the value of $\tan\theta$?

$$1. \frac{21}{2\sqrt{46}} \quad 2. \frac{25}{2\sqrt{46}} \quad 3. \frac{2\sqrt{46}}{21} \quad 4. \frac{2\sqrt{46}}{25}$$

A fruit seller buys 480 bananas for ₹1,200. Some of these bananas are rotten and hence, they are thrown away. He sells the remaining bananas at ₹3.5 each and makes a profit of ₹396. What is the percentage of bananas thrown away?

- Q.7)-** 1. 4% 2. 5% 3. 6% 4. 4.5%

A sum of ₹10,000 was invested at a rate of 10% per annum for a period of 2 years, compounded half-yearly. Find the compound interest.

1. ₹2,155.0625 2. ₹2,055 3. ₹2,255 4. ₹2,151.0625

A metallic sphere of radius 21 cm is melted and then recast into smaller cones each with a radius of 7 cm, and a height of 3 cm. Find the number of cones obtained.

1. 325 2. 252 3. 225 4. 522

Simplify the given expression.

Q.10)- $\frac{z(\sin^4 z - \cos^4 z + 1)}{\sin^2 z}$

1. 9 2. 6 3. 2 4. 4

Three persons A, B and C invested some money in a business. The share of A is twice the share of B, and the share of B is thrice the share of C. After 1 year, they earned ₹6,000. Find the money A received.

1. ₹3,000 2. ₹3,200 3. ₹3,500 4. ₹3,600

Q.12)- If 18 mechanics can repair 90 cars in 10 days, how many mechanics will be required to repair 150 cars in 12 days?

1. 30 2. 25 3. 27 4. 20

The data given in the table shows the number of boys and girls enrolled for different games in an academy over 5 years.

years	Basketball		Football		Cricket	
	Boys	Girls	Boys	Girls	Boys	Girls
2018	46	34	42	37	45	35
2019	40	41	44	38	42	32
2020	43	40	40	32	44	38
2021	37	44	43	25	34	28
2022	34	41	41	32	41	39

Q.13)- Which game has the maximum enrollment and during which year?

1. Football in 2019 2. Basketball in 2019 3. Basketball in 2020 4. Cricket in 2020

In a ΔPMN , S is a point on PM which divides PM in the ratio of 5 : 7. The line segment ST is parallel to MN. If $MN = 24$ cm, then what is the length (in cm) of segment ST?

1. 16 2. 17 3. 14 4. 10

Savitha and Parnika decided to run a 2250 m long race on a track as long as the length of the race. But Savitha gave Parnika a 396 m head start and also allowed her to start 9 seconds before Savitha started running. Parnika ran at 6 m per second and Savitha caught up with Parnika 250 seconds after Savitha started running. What was Savitha's speed (in m/s) during the race?

Q.15)-

1. 8
2. 7.2
3. 7.8
4. 7.5

On an item having a marked price of ₹500, Ravi was offered successive discounts of 36% and 5%, respectively, while

Q.16)- Prabhat was offered a single discount of 40%. Who paid more for the item and by how much?

1. Prabhat, ₹4
2. Prabhat, ₹5
3. Ravi, ₹5
4. Ravi, ₹4

Q.17)- After allowing a discount of 12.5% on the marked price, an article is sold for ₹2,625. Find its marked price.

1. ₹2,975
2. ₹2,950
3. ₹2,900
4. ₹3,000

Two jars A and B are containing the solutions of two liquids P and Q. The ratio of the liquids P and Q in the jars A and B are 2 : 19 and 1 : 11, respectively. If 7 litres of the solution of jar A and 4 litres of the solution of jar B are mixed,

Q.18)- what is the ratio of the solutions P and Q in the new mixture?

1. 10 : 1
2. 9 : 1
3. 1 : 10
4. 1 : 9

Q.19)- If $\sin\theta + \tan\theta = p$ and $\tan\theta - \sin\theta = q$, then which of the relation satisfies for given values of p and q?

1. $p^2 + q^2 = 4pq$
2. $p^2 + q^2 = 4\sqrt{pq}$
3. $p^2 - q^2 = 4\sqrt{pq}$
4. $p^2 - q^2 = 8\sqrt{pq}$

Two circles with centres A and B touch each externally. PQ is a direct common tangent which touches the circle at P and Q. If the radii of the circles 9 cm and 4 cm, respectively, then the length of PQ (in cm) is equal to:

- Q.20)-**
1. 6.5
 2. 12
 3. 13
 4. 5

An item was sold at ₹5,474 after two successive discounts of 12.5% and 8% were offered on its Marked Price. What was the Marked Price (in ₹) of the item?

1. 6,600
2. 6,750
3. 6,800
4. 7,000

AB and BC are two chords of a circle with centre O. Both chords are on either side of the centre O. Point A and point C are connected to the centre O, such that $\angle BAO=36^\circ$ and $\angle BCO=48^\circ$. What is the degree measure of the angle subtended by the minor arc AC at the centre O?

- Q.22)-**
1. 120°
 2. 144°
 3. 136°
 4. 168°

Q.23)- The remainder of the term $9+9^2+\dots+9^{(2n+1)}$ when divided by 6 is:

1. 2
2. 1
3. 4
4. 3

Q.24)- If $ax+by=1$ and $bx+ay=\frac{2ab}{a^2+b^2}$, then the value of x (in terms of a and b) is:

1. $\frac{2a}{a^2+b^2}$
2. $\frac{a}{a^2+b^2}$
3. $\frac{b}{a^2+b^2}$
4. $\frac{2b}{a^2+b^2}$

The simple interest on a sum of money in 6 years at the rate of 15% per annum is ₹1,440 less than the simple interest accrued on the same sum in 9 years at 18% per annum. What is the sum of money (in ₹)?

1. 2,000 2. 2,400 3. 2,700 4. 1,800

Answer key

Q.1	2	Q.2	1	Q.3	1	Q.4	4	Q.5	1
Q.6	1	Q.7	2	Q.8	1	Q.9	2	Q.10	2
Q.11	4	Q.12	2	Q.13	3	Q.14	4	Q.15	3
Q.16	4	Q.17	4	Q.18	3	Q.19	3	Q.20	2
Q.21	3	Q.22	4	Q.23	4	Q.24	2	Q.25	1

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The advertisement features a green background with a red banner at the top containing the text "SSC CGL-2023". Below this, a large yellow banner displays "Tier-2 Rs.149 Test Series". To the right, a man with a beard, wearing a black polo shirt with the RBE logo, stands with his arms crossed. The text "Based on Latest Pattern" and "20 Tier-2 Mocks" is also present. The RBE logo is shown in the top right corner.



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By: Shubham Jain
(Selected as GST Inspector)
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14/08/2023-> (9:00 AM - 10:00 AM)

Q.1)- The marked price of a book is ₹250 and it was sold at a discount of 12%. The selling price of the book is:

1. ₹220
2. ₹225
3. ₹230
4. ₹234

Q.2)- In a show room, the ratio of TVs and rice cookers is 2 : 3. Find the percentage of rice cookers in the show room.

1. 40%
2. 30%
3. 50%
4. 60%

Raju and Sohan started a car race from the same point, in the same direction and at the same circular track of length 1725 m with speeds of 72 km/h. and 90 km/h, respectively. After how much time (in seconds) will they

Q.3)- meet again for the first time?

1. 350 seconds
2. 345 seconds
3. 335 seconds
4. 340 seconds

Roma spends 25% of her income on food, 15% on children's books and 75% of the remaining income on uniforms.

Q.4)- What is the percentage of income she is left with?

1. 20%
2. 35%
3. 19%
4. 15%

Q.5)- Solve $(0.125 \times 0.01) \div (0.5 \times 0.005)$.

1. 0.7
2. 0.5
3. 0.6
4. 0.8

In ΔXYZ , L and M are the middle points of the sides XY and XZ, respectively. N is a point on the segment LM such

Q.6)- that $LN : NM = 1 : 2$. If $LN = 5$ cm, then YZ is equal to:

1. 26 cm
2. 24 cm
3. 28 cm
4. 30 cm

If the slant height and radius of a right circular cone are 28 cm and 21 cm, respectively, then the total surface area of the right circular cone (in cm^2) is:

Q.7)- Take $\pi = \frac{22}{7}$

1. 3324
2. 3234
3. 3243
4. 3342

Q.8)- In right angled triangle ABC, if $\angle A = 30^\circ$, find the value of $3 \sin A - 4 \sin^3 A$.

1. 1
2. -2
3. 2
4. -1

Q.9)- Two equal circles of radius 6 cm intersect each other such that each pass through the centre of the other. The length (in cm) of the common chord is:

1. $5\sqrt{3}$
2. $4\sqrt{3}$
3. $3\sqrt{3}$
4. $6\sqrt{3}$

Q.10)- The sides of a triangle are of length 8 cm, 15 cm and 17 cm. Find the area of the triangle.

1. 70 cm^2
2. 60 cm^2
3. 65 cm^2
4. 75 cm^2

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A shopkeeper has announced a 25% rebate on the prices of stationery items. If anyone needs to have a rebate of ₹40, then how many stationery items costing ₹32 should be purchased?

- Q.11)-**
- 1. 6 items
 - 2. 4 items
 - 3. 3 items
 - 4. 5 items

Arun brought 50 kg of rice at a discount of 15% on the marked price. For purchasing bulk quantity, he was given 5 kg of wheat (the marked price of which was 60% the marked price of rice) free of cost. Had the retailer sold both items at their marked price to his other customers, then approximately what would be the profit percentage that the shopkeeper could earn?

- Q.12)-**
- 1. 25.2%
 - 2. 24.7%
 - 3. 22.8%
 - 4. 23.5%

- Q.13)-** If $x + 3y = 6$, what is the value of $x^3 + 27y^3 + 54xy$?

- 1. 216
- 2. 258
- 3. 264
- 4. 220

What sum will become ₹9,826 in 18 months if the rate of interest is $2\frac{1}{2}\%$ per annum and the interest is compound half-yearly?

- Q.14)-**
- 1. ₹9,392.00
 - 2. ₹9,466.55
 - 3. ₹9,444.00
 - 4. ₹9,512.45

A money lender lent ₹30,000 in two parts, one at the rate of 8% and the other at 9%. If the total annual simple interest on the amount is ₹2,650, then what is the amount of money lent at the rate of 8%?

- Q.15)-**
- 1. ₹5,500
 - 2. ₹4,500
 - 3. ₹6,000
 - 4. ₹5,000

- Q.16)-** The perimeter of two similar triangles GST and FAX are 48 cm and 36 cm, respectively. If FA = 12 cm, then GS is:

- 1. 18 cm
- 2. 24 cm
- 3. 12 cm
- 4. 16 cm

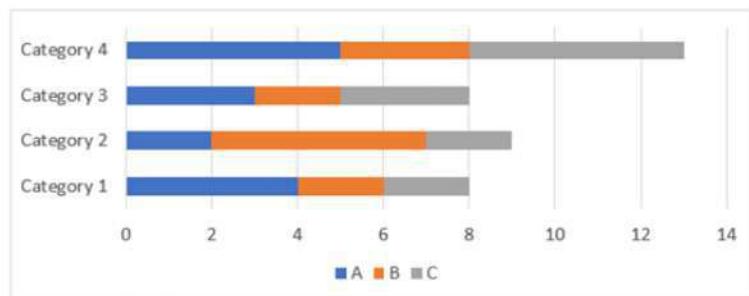
The sales of an item of a company in 4-quarters are given below.



- Q.17)-** If the difference in sales of item in 3rd quarter and 4th quarter is 36, then the total sale of the 1st quarter is _____.

- 1. 250
- 2. 264
- 3. 260
- 4. 256

The number of patients in four different categories in three hospitals A, B and C are given below.



Q.18)- The total number of patients in three hospitals A, B and C, respectively, are:

1. 12, 12, 14 2. 14, 12, 12 3. 14, 13, 12 4. 12, 14, 12

Q.19)- Simplify the given expression. $\frac{(381+119)^2 + (381-119)^2}{(381)^2 + (119)^2}$

1. 2 2. -2 3. -1 4. 1

A can complete a piece of work in 9 days. B and C can complete the same work in 12 days and 18 days respectively. If A, B, C work together, then in how many days will they complete the work?

1. 15 2. 8 3. 4 4. 10

Q.21)- The average weight of 45 students of a school is 55 kg. If the weight of the teacher be included, the average weight rises by 500 grams. Find the weight (in kg) of the teacher.

1. 79 2. 77 3. 80 4. 78

Study the table given below and answer the question that follows.

The table below shows the total number of students studying different subjects in a college and the percentage of boys and girls.

Subject	Number of Students	Percentage of Girls	Percentage of Boys
Hindi	110	60	40
English	70	50	50
Physics	50	30	70
Chemistry	40	80	20
Mathematics	80	20	80
Computers	90	40	60

Q.22)- What is the total number of students in all the subjects?

1. 420 2. 200 3. 240 4. 440

Q.23)- If θ be an acute angle and $\tan\theta + \cot\theta = 2$, then the value of $2\tan^2\theta + \cot^2\theta + \tan^4\theta\cot^4\theta$ is:

1. 3 2. 6 3. 2 4. 4

Q.24)- If $\operatorname{cosec} A + \cot A = 7$, then $\operatorname{cosec} A$ is equal to:

1. $\frac{16}{7}$ 2. $\frac{25}{7}$ 3. $\frac{11}{7}$ 4. $\frac{19}{7}$

Q.25)- The cost of 4 rings and 2 bangles of gold is ₹40,000. What is the cost of 10 rings and 5 bangles?

1. ₹90,000 2. ₹1,20,000 3. ₹80,000 4. ₹1,00,000

Answer key

Q.1	1	Q.2	4	Q.3	2	Q.4	4	Q.5	2
Q.6	4	Q.7	2	Q.8	1	Q.9	4	Q.10	2
Q.11	4	Q.12	2	Q.13	1	Q.14	2	Q.15	4
Q.16	4	Q.17	2	Q.18	2	Q.19	1	Q.20	3
Q.21	4	Q.22	4	Q.23	4	Q.24	2	Q.25	4

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14/08/2023-> (11:45 AM - 12:45 PM)

Q.1)- Simplify the given expression. $\frac{(4.2)^2 - 0.008}{(4.2)^2 + 0.84 + 0.04}$

1. 4 2. 2 3. -2 4. -4

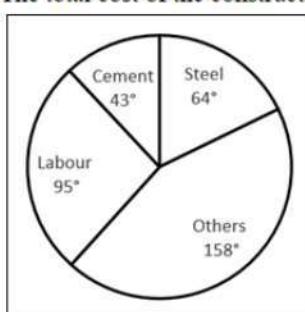
Q.2)- If two qualities of a fruit costing ₹20 per kg and ₹38 per kg are mixed in the ratio of 5 : 4, then find the cost of the mixture per kg (in ₹).

1. 31 2. 28 3. 29 4. 30

Q.3)- The number 76050 is NOT divisible by which of the following numbers?

1. 9 2. 4 3. 13 4. 3

Break-up of the cost of construction of a house is shown in the following pie chart.
The total cost of the construction of a house is ₹3,79,800.



Q.4)- What is the amount spent on steel?

1. ₹1,36,728 2. ₹67,520 3. ₹67,52,000 4. ₹6,75,200

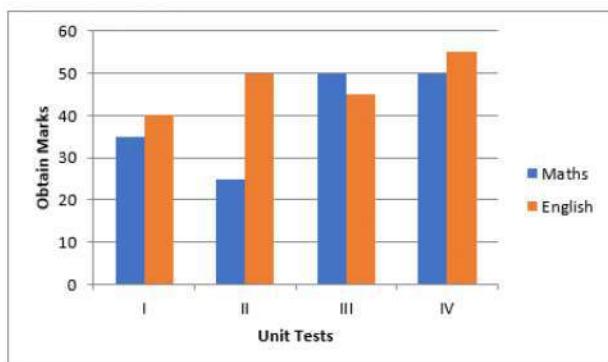
Q.5)- If $x + \frac{1}{x} = 2$, then find the value of $x^5 + \frac{1}{x^5}$.

1. 2 2. 4 3. 3 4. 1

Q.6)- Two circles touch each other externally at P. AB is a direct common tangent to the two circles, A and B are points of contact and $\angle PAB = 22^\circ$. The measure of $\angle ABP$ is:

1. 72° 2. 70° 3. 44° 4. 68°

The graph shows the marks obtain by the four students in mathematics and English in four Unit Tests.



Q.7)- The difference between the average marks obtain for all unit tests in both subject is:

1. 7.50 2. 7.40 3. 7.25 4. 7.75

Q.8)- Simplify: $\frac{(0.83)^3 - (0.1)^3}{(0.83)^2 + 0.083 + 0.01} = ?$

1. 0.98 2. 0.93 3. 0.73 4. 0.27

The speed of a car going from A to B is 110 km/h, while coming back, its speed is 76 km/h. What is the average speed during the entire journey?

1. $89\frac{83}{93}$ km/h 2. $82\frac{91}{97}$ km/h 3. $87\frac{81}{99}$ km/h 4. $83\frac{89}{93}$ km/h

Q.10)- The total surface area of a cylinder whose radius is 6 cm and height is 8 cm is (*use $\pi = \frac{22}{7}$*):

1. 575 cm² 2. 658 cm² 3. 528 cm² 4. 625 cm²

Q.11)- Find the value of $\sin 47^\circ \cos 33^\circ - \cos 43^\circ \sin 57^\circ$.

1. 1 2. $\frac{1}{2}$ 3. -1 4. 0

The table given below shows the number of aerated drinks—A, B, C, D—manufactured (in thousands) by a company over the years.

YEAR	Aerated Drinks			
	A	B	C	D
2019	250	200	140	115
2020	200	230	170	120
2021	260	210	195	135
2022	275	175	190	155

Q.12)- The manufacturing numbers of which aerated drink saw a continuous decrease from 2020 to 2022?

1. A 2. C 3. B 4. D

Q.13)- The radius of a circle is increased by 20%. Find the percentage increase in the circumference of the circle.

1. 20% 2. 30% 3. 40% 4. 15%

In an election, a candidate who got 73% of the votes is elected by a majority of 1426 votes. If 20% of votes are invalid, then what is the total number of votes polled?

1. 4824 2. 2865 3. 3875 4. 1878

Q.15)- What is the third proportional of $2\sqrt{3}$ and $6\sqrt{5}$?

1. $50\sqrt{6}$ 2. $40\sqrt{3}$ 3. $20\sqrt{6}$ 4. $30\sqrt{3}$

The marked price on a fancy item is ₹250 but there is an 18% discount during festival season. The price of the fancy item after discount is:

1. ₹202 2. ₹208 3. ₹204 4. ₹205

Two persons A and B are running around a circular track of length 1200 m with respective speeds of 27 kmph and 36 kmph. They started at the same time from the same point and are running in the same direction. When

Q.17)- will they meet for the first time on the track (in seconds)?

1. 240 2. 480 3. 420 4. 360

A can finish a work in 25 days, and B can do the same work in 15 days. B worked for 10 days and left the job. A alone can finish the remaining work in how many days?

1. $8\frac{1}{3}$ days 2. $5\frac{1}{3}$ days 3. $7\frac{1}{3}$ days 4. $6\frac{1}{3}$ days

Q.19)- If $3\cot A = 4$ and A is an acute angle, then find the value of $\sec A$.

1. $\frac{5}{3}$ 2. $\frac{5}{4}$ 3. $\frac{4}{5}$ 4. $\frac{3}{4}$

Q.20)- 9 cm long perpendicular is drawn from the center of the circle to a 24 cm long chord. Find the radius of the circle.

1. 16 cm 2. 17 cm 3. 18 cm 4. 15 cm

Q.21)- If $\sec \theta + \tan \theta = 4$, then $\sec \theta - \tan \theta =$ _____.

1. $\frac{1}{2}$ 2. 2 3. 4 4. $\frac{1}{4}$

Suhas, a 3.15 m tall tree, and a building are positioned such that their feet on the ground are collinear and the tree is located between Suhas and the building. The tree is located at a distance of 7.5 m from Suhas and at a distance of 45 m from the building. Further, the eyes of Suhas, the top of the tree, and the top of the building fall in one line, and the eyes of Suhas are at a height of 1.8 m from the ground. Find the height (in m) of the building.

Q.22)-

1. 10.25 2. 11.25 3. 10.75 4. 11.50

A man borrowed a certain sum of money at the rate of 10% per annum simple interest for the first three years and 15% per annum simple interest for the period beyond three years. If he pays a total interest of ₹2,884.50 at the end of 7 years, then the sum of money (in ₹) that he borrowed is:

1. 3,205 2. 3,860 3. 3,090 4. 4,550

Q.24)- A shopkeeper earns 15% profit on his goods. He loses 10% of his goods during transportation. What is his overall profit/ loss percentage?

1. Loss, 3.5% 2. Profit, 3.5% 3. Loss, 5% 4. Profit, 5%

Q.25)- A merchant marked his goods 20% above the cost price and sold the goods at a profit of 8%. The rate of discount is:

1. 10% 2. 15% 3. 8% 4. 12%

Answer key

Q.1	1	Q.2	2	Q.3	2	Q.4	2	Q.5	1
Q.6	4	Q.7	1	Q.8	3	Q.9	1	Q.10	3
Q.11	4	Q.12	3	Q.13	1	Q.14	3	Q.15	4
Q.16	4	Q.17	2	Q.18	1	Q.19	2	Q.20	4
Q.21	4	Q.22	2	Q.23	1	Q.24	2	Q.25	1

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14/08/2023-> (2:30 PM - 3:30 PM)

Q.1)- The value of $\frac{1+\sin A}{\cos A} + \frac{\cos A}{1+\sin A}$ is:

- 1. sec A
- 2. 2 cosec A
- 3. 2 sec A
- 4. cosec A

Q.2)- If $\cos 5\alpha = \sin \alpha$ and $5\alpha < 90^\circ$, then the value of $\tan 2\alpha$ is:

- 1. $\sqrt{2}$
- 2. $\sqrt{3}$
- 3. $\sqrt{3}$
- 4. $\frac{1}{\sqrt{2}}$

In a 120 metre race, P beats S by 6 metres. If S starts with a head start of 7.5 metres and it is a 100 metre race, then who wins the race and how many metres? (Correct to 2 decimal places)

Q.3)- The fourth proportion of number 8, 20 and 15 is:

- 1. P, 2.63
- 2. S, 3.63
- 3. P, 3.63
- 4. S, 2.63

Q.4)- If an article is sold for ₹402, there is a loss of 33%. At what price should it be sold to get 37% profit?

- 1. ₹781
- 2. ₹822
- 3. ₹911
- 4. ₹618

Q.5)- The fourth proportion of number 8, 20 and 15 is:

- 1. 10
- 2. 37.5
- 3. 200
- 4. 10.6

Q.6)- If $p + q = 12$ and $pq = 14$, then find the value of $p^2 - pq + q^2$.

- 1. 102
- 2. 144
- 3. 192
- 4. 181

A 10-litre solution of milk and water contains 8 litres of milk. 2 litres of the solution is replaced by pure milk and mixed. The process is repeated two more times. How much milk (in litres) is present in the mixture so obtained?

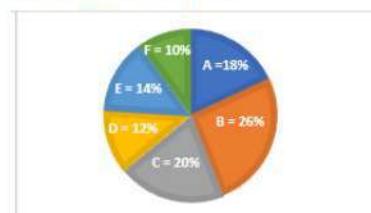
- 1. 8.597
- 2. 8.679
- 3. 8.796
- 4. 8.976

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The Pie chart shows the percentage distributions of total number of laptops (both Dell and HP) sold by six stores in March.

Refer to the pie chart and table carefully and answer the given questions.

Total number = 11200



Ratio of the numbers of Dell and HP sold

Stores	Ratio
A	5 : 4
B	7 : 6
C	1 : 4
D	11 : 10
E	4 : 3
F	3 : 1

What is the central angle corresponding to the total number of laptops (both Dell and HP) sold by store E? (correct to one decimal place)

Q.8)-

1. 64.8°
2. 43.2°
3. 50.4°
4. 63.2°

The table given below shows the number of aerated drinks A, B, C, D, manufactured (in thousands) by a company over the years.

YEAR	Aerated Drinks			
	A	B	C	D
2019	250	200	140	115
2020	200	230	170	120
2021	260	210	195	135
2022	275	175	190	155

Q.9)- In which year was the cumulative manufacturing of aerated drinks B and C the highest?

1. 2022
2. 2020
3. 2019
4. 2021

Q.10)- Simplify the given expression. $\frac{(x+3)^3 + (x-3)^3}{x^2 + 27}$

1. $3x$
2. x
3. $2x$
4. $4x$

The marked price of a shirt is ₹2,000. It is sold at a discount of 15%. The shopkeeper has allowed a further discount of 5% due to off season. Find the selling price of the shirt.

Q.11)-

1. ₹1,710
2. ₹1,615
3. ₹1,700
4. ₹1,650

If ₹2,000 is invested at a simple interest rate of 5% per annum and the interest is added to the principal after 10 years, then in how many years will it amount to ₹4,000 at the same rate of interest?

Q.12)-

1. $18\frac{2}{3}$ years
2. $16\frac{1}{3}$ years
3. $16\frac{2}{3}$ years
4. $18\frac{1}{3}$ years

Jason can do a piece of work alone in 23.4 days, while Rafique can do the same piece of work alone in 39 days. In how many days can the duo complete the same work if they work together?

Q.13)-

1. 14.625
2. 14.375
3. 14.875
4. 14.750

Q.14)- Triangle ABC is similar to ΔPQR and $PQ=10$ cm. If the area of ΔABC is 32 cm^2 and the area of ΔPQR is 50 cm^2 , then the length of AB (in cm) is equal to:

1. 8 2. 4 3. 10 4. 6

Q.15)- A discount of 20% is given on the marked price of a cycle, and still there is a profit of 20%. If the profit is ₹800, find the marked price of the cycle.

1. ₹4,800 2. ₹6,000 3. ₹5,800 4. ₹4,000

Q.16)- If $(y^2 + \frac{1}{y^2}) = 167$ and $y > 0$, find the value of $(y + \frac{1}{y})$.

1. -13 2. $-\sqrt{165}$ 3. 13 4. $\sqrt{165}$

Q.17)- Simplify the given equation. $(1 + \tan^2 A)(1 + \cot^2 A) = ?$

1. $\frac{1}{\cos^2 A(1 + \sin^2 A)}$ 2. $\frac{1}{\sin^2 A + \operatorname{cosec}^2 A}$ 3. $\frac{1}{\sin^2 A(1 - \sin^2 A)}$ 4. $\frac{1}{\sin^2 A(1 + \cos^2 A)}$

Q.18)- Rajat, Pooja and Abha participate in the election. If the total votes polled are 40,000 and 10% of votes are invalid, Rajat got 36% of valid votes and Pooja got 40% of valid votes, then find the number of votes Abha got.

1. 1024 2. 9245 3. 5760 4. 8640

Q.19)- If a 10-digit number $620x976y52$ is divisible by 88, then the least value of $(x^2 + y^2)$ will be:

1. 7 2. 8 3. 10 4. 11

Q.20)- What is the mean proportional of 8.41 and 16.81?

1. 13.69 2. 12.79 3. 11.89 4. 9.88

Q.21)- \overline{CT} is a tangent to a circle at the point T on the circle. Chord \overline{AB} of the circle is extended to meet the tangent \overline{CT} at the point C. If $m(\overline{AB}) = 3$ cm and $m(\overline{BC}) = 2.4$ cm, find the length (in cm) of the tangent \overline{CT} .

1. 3.2 2. 4.0 3. 3.6 4. 4.2

The following bar graph shows the number of thesis submitted in six months.

The total submission of thesis in April 21, May 21, and June 21 is what percentage of the total submission of thesis in July 21, August 21, and Sept 21? (Rounded off to two decimal places).



Q.22)-

1. 85.17% 2. 79.12% 3. 102.34% 4. 70.21%
Telegram (Previous year papers PDFs [SSC,Railway,DSSSB,UP SI]):

https://t.me/RBE_S

YouTube (Free lectures and job updates): <https://www.youtube.com/c/RBERevolutionByEducation>

A transverse common tangent is drawn to two circles of radius 8.5 cm and 5.5 cm. The centres of the two circles are 18 cm apart. What is the length (in cm) of the tangent?

- Q.23)-
1. $10\sqrt{3}$ 2. $10\sqrt{2}$ 3. $8\sqrt{2}$ 4. $8\sqrt{3}$

Q.24)- Find the surface area of a sphere whose radius is 3.5 cm (*use $\pi = \frac{22}{7}$*).

1. 146 cm^2 2. 160 cm^2 3. 152 cm^2 4. 154 cm^2

In a triangle ΔPQR , the bisectors of $\angle P$ and $\angle R$ meet at a point M inside the triangle. If the measurement of

Q.25)- $\angle PMR = 127^\circ$, then the measurement of $\angle Q$ is:

1. 74° 2. 90° 3. 180° 4. 106°

Answer key

Q.1	3	Q.2	3	Q.3	4	Q.4	2	Q.5	2
Q.6	1	Q.7	4	Q.8	3	Q.9	4	Q.10	3
Q.11	2	Q.12	3	Q.13	1	Q.14	1	Q.15	2
Q.16	3	Q.17	3	Q.18	4	Q.19	3	Q.20	3
Q.21	3	Q.22	1	Q.23	3	Q.24	4	Q.25	1



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By: Shubham Jain
(Selected as GST Inspector)
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14/08/2023-> (5:15 PM - 6:15 PM)

Q.1)- What is the third proportional to 12 and $6\sqrt{5}$?

1. 18
2. 21
3. 15
4. 12

The curved surface area of a right circular cone of diameter 42 cm is 990 cm^2 . What is the slant height (in cm) of

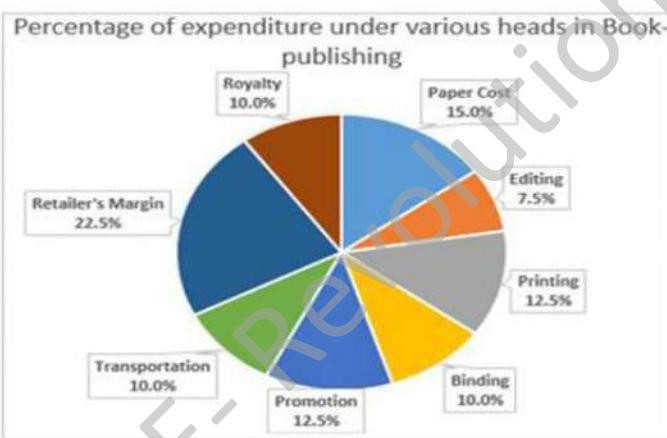
Q.2)- the cone? [Use $\pi = \frac{22}{7}$]

1. 12
2. 15
3. 10
4. 24

A shopkeeper marks his goods 35% above cost price. He then allows some discount on it. If he makes a profit of 14%, then the rate of discount is:

1. 17.77%
2. 14.44%
3. 16.66%
4. 15.55%

The pie chart below gives the expenses under different heads that a publisher of books has to incur towards the cost of selling a book. All figures are given as percentages of the total expenditure incurred. If the amount spent on printing is ₹1,40,000, which of the options given below does NOT give correct information?



Q.4)-

1. Cost of editing is ₹84,000
2. Cost of transportation is ₹1,12,000
3. Retailer's margin is ₹2,54,000
4. Cost of paper is ₹1,68,000

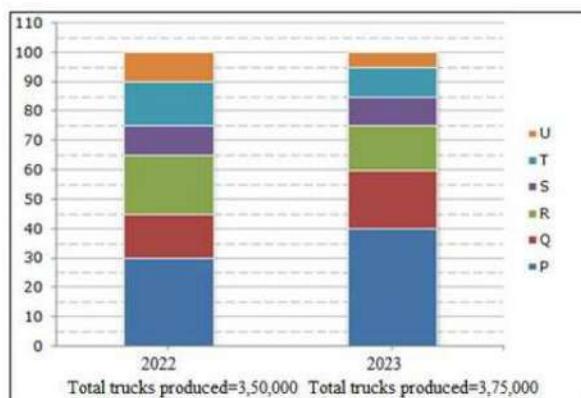
Q.5)- Ram can complete a piece of work in 18 days, Reena can complete the same work in 12 days, and with the help of Shyam, they finish the same work in six days. In how many days can Shyam alone complete the same work?

1. 42 days
2. 36 days
3. 24 days
4. 30 days

Q.6)- If θ is an acute angle and $\sin\theta = \frac{43}{47}$, what is the value of $\cot\theta$?

1. $\frac{43}{6\sqrt{10}}$
2. $\frac{47}{6\sqrt{10}}$
3. $\frac{6\sqrt{10}}{43}$
4. $\frac{6\sqrt{10}}{47}$

Percentage distribution of Six different types of Trucks manufactured by a Company over Two Years is shown below.



Q.7)- How much more is the actual distribution of Truck Q in the year 2023 as compared to 2022?

1. 22,500
2. 20,400
3. 23,500
4. 19,800

Q.8)- If oranges are bought at 11 for ₹10 and sold at 10 for ₹11, what is the gain or loss percentage?

1. Loss = 11%
2. Loss = 21%
3. Gain = 21%
4. Gain = 11%

Study the following table and answer the question:

Height (in cm)	No. of Boys
Less than 150	20
Less than 155	38
Less than 160	52
Less than 165	67
Less than 170	82
Less than 175	98

Q.9)- What is the number of boys whose height is less than 170?

1. 98
2. 67
3. 52
4. 82

Q.10)- Which of the numbers amongst 25560, 35751, 48168, and 49608 is NOT divisible by 24?

1. 48168
2. 25560
3. 49608
4. 35751

Q.11)- The area of two similar triangles TUV and PQR are 18 cm^2 and 32 cm^2 , respectively. If TU = 6 cm, then PQ is equal to:

1. 8 cm
2. 4 cm
3. 64 cm
4. 2 cm

Q.12)- If $\text{cosec } \theta = \frac{17}{15}$, then what will be the value of $\cos \theta$?

1. 1
2. $\frac{8}{17}$
3. $\frac{15}{17}$
4. $\frac{7}{17}$

Anil and Arun started for car race from the same point in the same direction and at the same time on a circular track of length 2575 m with speeds 72 km/h and 90 km/h, respectively. After how much time (in seconds) will they meet again for the first time?

1. 525
2. 510
3. 520
4. 515

Q.14)- The marked price of an article is ₹2,500 and selling price is ₹1,800, then the discount percentage is:

1. 27% 2. 34% 3. 32% 4. 28%

A mixture of 70 litres of wine and water contains 10% of water. How much water must be added to make the water $12\frac{1}{2}$ % of the resulting mixture?

Q.15)- 1. 5 litres 2. 2 litres 3. 3 litres 4. 4 litres

Q.16)- An equilateral triangle has sides of 18 cm each. The ratio of the inradius to circumradius of the triangle is:

1. 1 : 2 2. 3 : 4 3. 3 : 2 4. 2 : 1

Q.17)- The population of a certain village increases by 5 per cent annually. Its present population is 8200. After two year the population will be (approximately):

1. 9161 2. 9246 3. 9040 4. 9200

Q.18)- If $a^2 + b^2 + c^2 = 160$ and $a + b + c = 16$, find $ab + bc + ca$.

1. 84 2. 96 3. 48 4. 42

Q.19)- If $\triangle PQR \cong \triangle STR$, $\angle Q = 50^\circ$ and $\angle P = 70^\circ$ and PQ is 8 cm. Which of the following options is NOT correct?

1. $TR = RQ$ 2. $PR = RS$ 3. $\angle TSR = 80^\circ$ 4. $\angle PRT = 60^\circ$

Q.20)- The given expression is equal to: $(\cot B - \tan B) \cdot \sin B \cdot \cos B$

1. $1 - 2\cos^2 B$ 2. $2\cos^2 B - 1$ 3. $1 - 2\sec^2 B$ 4. $2\sec^2 B - 1$

Q.21)- If $a - b = 5$ and $ab = 24$, find the value of $a^3 - b^3$.

1. 360 2. 455 3. 485 4. 385

In a circle with centre O, arc CD subtends an angle of 60° at the centre of the circle whose radius is 21 cm. Calculate the length of arc CD.

1. 22 cm 2. 24 cm 3. 20 cm 4. 18 cm

In 't' years, the simple interest earned on a certain amount at the rate of 10% per annum is $5/8$ th of the principal amount.

If the rate of interest is made three-fourth of 10% and the simple interest remains the same, which of the following

Q.23)- statements is true about the changed value of time?

1. It remains the same as 't'. 2. It becomes three-fourth of the time 't'. 3. It increases to $8\frac{1}{3}$ years.. 4. It decreases to $5\frac{1}{2}$ years.

Simplify the expression:

Q.24)- $\frac{1}{8} \left[\frac{1}{b-1} - \frac{1}{b+1} - \frac{2}{b^2+1} - \frac{4}{b^4+1} \right]$

1. $\frac{1}{b^8+1}$ 2. $\frac{8}{b^8+1}$ 3. $\frac{1}{b^8-1}$ 4. $\frac{8}{b^8-1}$

A number is first increased by 16% and then increased by 20%. The number so obtained is now decreased by 40%. The net decrease percentage in the original number is:

1. $11\frac{13}{25}\%$ 2. $13\frac{7}{25}\%$ 3. $16\frac{12}{25}\%$ 4. $15\frac{9}{25}\%$

Answer key

Q.1	3	Q.2	2	Q.3	4	Q.4	3	Q.5	2
Q.6	3	Q.7	1	Q.8	3	Q.9	4	Q.10	4
Q.11	1	Q.12	2	Q.13	4	Q.14	4	Q.15	2
Q.16	1	Q.17	3	Q.18	3	Q.19	3	Q.20	2
Q.21	3	Q.22	1	Q.23	3	Q.24	3	Q.25	3

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By: Shubham Jain
(Selected as GST Inspector)
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17/08/2023-> (9:00 AM - 10:00 AM)

A cylindrical pillar is 84 cm in diameter and 5 m in height. Find the cost of painting the curved surface of the pillar at the rate of ₹15 per m^2 . (Use $\pi = \frac{22}{7}$)

- Q.1)-** 1. ₹208 2. ₹216 3. ₹198 4. ₹184

Q.2)- The six-digit number $N = 4a6b9c$ is divisible by 99, then the maximum sum of the digits of N is:

1. 27 2. 36 3. 18 4. 45

Simplify the expression:

Q.3)- $(2x + 13 - y)(2x - 13 - y)$

1. $4x^2 - y^2 - 4xy - 169$ 2. $4x^2 + y^2 + 4xy - 169$ 3. $4x^2 + y^2 - 4xy + 169$ 4. $4x^2 + y^2 - 4xy - 169$

Q.4)- In $\triangle CAB$, $\angle CAB = 90^\circ$ and $AD \perp BC$. If $AC = 24 \text{ cm}$, $AB = 10 \text{ cm}$, then find the value of AD (in cm).

1. 10.23 2. 8.23 3. 7.14 4. 9.23

Sourabh purchased an article for ₹48,000 and sold it at a loss of 12%. With that amount, she purchased another item and sold it at a gain of 20%. What is the overall gain or loss in ₹?

1. ₹14,208 loss 2. ₹2,688 loss 3. ₹2,688 gain 4. ₹14,208 gain

Q.6)- $\cot^2 \theta - \operatorname{cosec}^2 \theta$ equals to:

1. $\tan \theta$ 2. 0 3. 1 4. -1

Classification of 100 students based on the marks obtained by them in Mathematics and Physics in an examination is given below.

Subject	Marks out of 50				
	40 and above	30 and above	20 and above	10 and above	0 and above
Mathematics	9	32	80	92	100
Physics	4	21	66	81	100

Q.7)- How many students have got marks less than 10 in Mathematics?

1. 19 2. 12 3. 20 4. 8

Q.8)- If A is an acute angle and $8 \sec A = 17$, find the value of $\tan A$.

1. $\frac{8}{17}$ 2. $\frac{8}{15}$ 3. $\frac{15}{8}$ 4. $\frac{15}{17}$

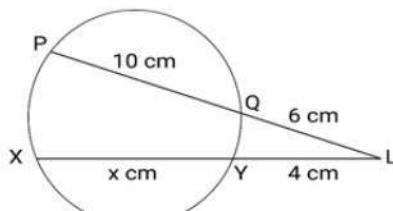
The difference between the simple and compound interest on a certain sum of money at an 8% rate of interest per annum for two years is ₹56. Find the sum.

1. ₹8,750 2. ₹8,057 3. ₹7,058 4. ₹7,805

Q.10)- If $(d + e + f) = 14$, $(d^2 + e^2 + f^2) = 96$, then find the value of $(de + ef + fd)$.

1. 50 2. 25 3. 100 4. 75

In the figure, chords $XY = x$ cm and $PQ = 10$ cm are intersecting each other at point L. Find the length of XY (in cm).



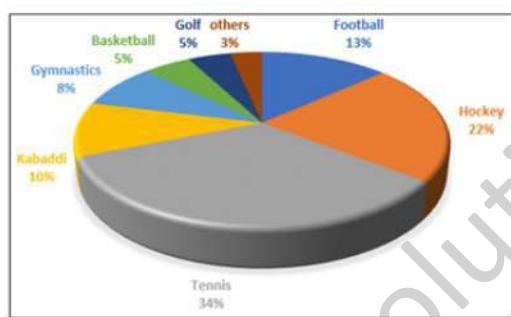
Q.11)-

1. 23 2. 20 3. 21 4. 22

Q.12)- Given that x varies directly as y and $x = 45$ when $y = 9$. What is the value of x when $y = 50$?

1. 190 2. 225 3. 250 4. 175

The following pie chart gives the budget allocation for various sports mentioned. The numbers shown are percentages over 360 degrees.



If the total amount for all the sports is ₹42,76,80,000 then the allocation for Hockey, Basketball, and Gymnastics

Q.13)- together exceeds the amount allocated to Football, Kabaddi, and Golf together by:

1. 9524000 2. 8316000 3. 29937600 4. 7453000

Q.14)- The simple interest on a sum of ₹7,400 for 36 months is ₹888. What is the rate percentage of interest per annum?

1. 3% 2. 8% 3. 4% 4. 5%

In an election between two candidates, 85% of the electorate cast their votes. 6% of the votes polled were declared invalid. If the winning candidate secured 60% of the valid votes, how many votes did the winning candidate receive if the number of eligible voters was 10000?

Q.15)-

1. 4804 2. 4794 3. 4784 4. 4824

A cask having a capacity of 600 litres is initially filled with wine. From this cask y litres of wine are first drawn and replaced with water. From this mixture, 120 litres are drawn and replaced with water. From this further diluted mixture, 120 litres are drawn again and replaced with water. The ratio of wine to water in the cask is now 12 : 13. What is the

Q.16)- value of y ?

1. 100 2. 200 3. 150 4. 125

Refer to the given data table and answer the following question:

Course	Boys	Girls
B. Sc.	82	90
B. A.	48	102
B. Com.	84	96
B. Ag.	58	48
B. tech.	58	42

Q.17)- What percentage of students who are pursuing B. Ag. are girls?

1. 52.28% 2. 45.28% 3. 47.92% 4. 54.71%

In figure, $\angle ADB$ is equal to:



Q.18)-

1. 80° 2. 50° 3. 40° 4. 60°

Q.19)- If $g = (2 - \sqrt{3})$, what will be the value of $(g^3 - \frac{1}{g^2})$?

1. 52 2. -52 3. $-30\sqrt{3}$ 4. $30\sqrt{3}$

Q.20)- If $\sin \theta \cos \theta = \frac{\sqrt{2}}{3}$, then the value of $(\sin^6 \theta + \cos^6 \theta)$ is:

1. $\frac{1}{3}$ 2. $\frac{2}{3}$ 3. $\frac{5}{3}$ 4. $\frac{4}{3}$

Q.21)- A shopkeeper sells a chair for ₹2,325 after allowing a discount of 22.5% on the marked price. The discount offered was:

1. 880 2. 1,050 3. 1,257 4. 675

Two trains are 125 metres and 99 metres in length, respectively, are running in opposite directions at the speeds of 40 km/h and 32 km/h, respectively. In how much time will they be completely clear of each other from the moment they meet?

Q.22)-

1. 11.2 sec 2. 10.2 sec 3. 12.2 sec 4. 9.2 sec

A man offers a 40% discount on an item which has been marked 50% above the cost price. If the selling price of the item is ₹1,305, then the cost price is:

1. ₹1,680 2. ₹1,560 3. ₹1,450 4. ₹1,360

Raju and Ramu together can do a piece of work in 8 days, and Raju alone can do it in 12 days. In how many days can Ramu alone do it?

1. 22 days 2. 18 days 3. 20 days 4. 24 days

Q.25)- In an isosceles triangle, if the unequal angle is 4 times the sum of the equal angles, then each equal angle is:

1. 21° 2. 25° 3. 18° 4. 30°

Answer key

Q.1	3	Q.2	1	Q.3	4	Q.4	4	Q.5	3
Q.6	4	Q.7	4	Q.8	3	Q.9	1	Q.10	1
Q.11	2	Q.12	3	Q.13	3	Q.14	3	Q.15	2
Q.16	3	Q.17	2	Q.18	1	Q.19	3	Q.20	1
Q.21	4	Q.22	1	Q.23	3	Q.24	4	Q.25	3

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By: Shubham Jain
(Selected as GST Inspector)
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17/08/2023-> (11:45 AM - 12:45 PM)

The average weight of 64 students is 48 kg and the average weight of another class of 32 students is 24 kg. Find the
Q.1)- average weight of both classes combined.

1. 34 kg 2. 32 kg 3. 40 kg 4. 36 kg

Q.2)- If $a : b = 3 : 7$, then $(2a + 3b) : (3a + 2b)$ is:

1. 27 : 23 2. 21 : 23 3. 23 : 29 4. 21 : 29

Q.3)- The sum of money at simple interest amounts to ₹750 in 3 years and to ₹825 in 4 years. The sum is:

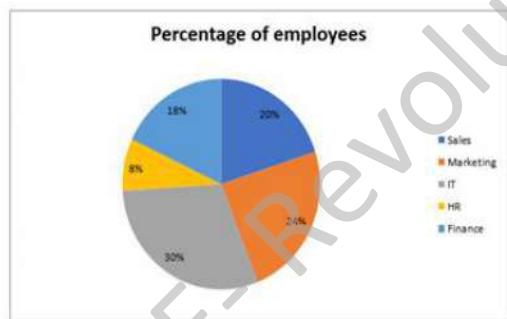
1. ₹500 2. ₹550 3. ₹525 4. ₹475

A hemispherical bowl is made of 1 cm thick steel. The inside radius of the bowl is 4 cm. The volume of the steel
Q.4)- (in cm^3) used in making the bowl is:

1. $41\frac{1}{3}\pi$ 2. $27\frac{1}{3}\pi$ 3. $35\frac{1}{3}\pi$ 4. $40\frac{2}{3}\pi$

Study the given pie-chart and answer the question that follows.

The pie-chart shows the percentage of employees in various departments of a company having a total workforce of 7,200.



Q.5)- If out of the total salary budget, 30% is used to give salaries to the sales department and the average salary of an employee from the sales department is ₹48,000, then find the total salary budget (in crores).

1. 23.55 2. 23.04 3. 23.40 4. 22.95

Q.6)- Simplify the given expression: $(5p + 3q)(5p - 3q)$

1. $25p^2 - 9q^2$ 2. $25p^2 + 9q^2 - 30pq$ 3. $25p^2 - 9q^2 + 30pq$ 4. $25p^2 + 9q^2$

If $\tan A = \frac{3}{4}$, find the value of the following expression.

Q.7)-
$$\frac{6 \sin A}{1 - \sin A}$$

1. 18 2. 24 3. 12 4. 9

Raju and Akber take 4 hours and 6 hours to type 32 pages and 48 pages, respectively, on a computer. They are given an assignment of typing 256 pages. If they work together, typing on two different computers, starting at the same time, how much time will they take to complete the assignment (in hours)?

- Q.8)-** 1. 14 2. 18 3. 16 4. 12

Q.9)- Three angles of a triangle are $(x - 15)^\circ$, $(x + 45)^\circ$ and $(x + 60)^\circ$. Identify the type of triangle.

1. Isosceles triangle 2. Equilateral triangle 3. Obtuse angle triangle 4. Right angle triangle

Q.10)- An arc of length 33π cm subtends an angle of 132° at the centre of the circle. Find the radius of the circle.

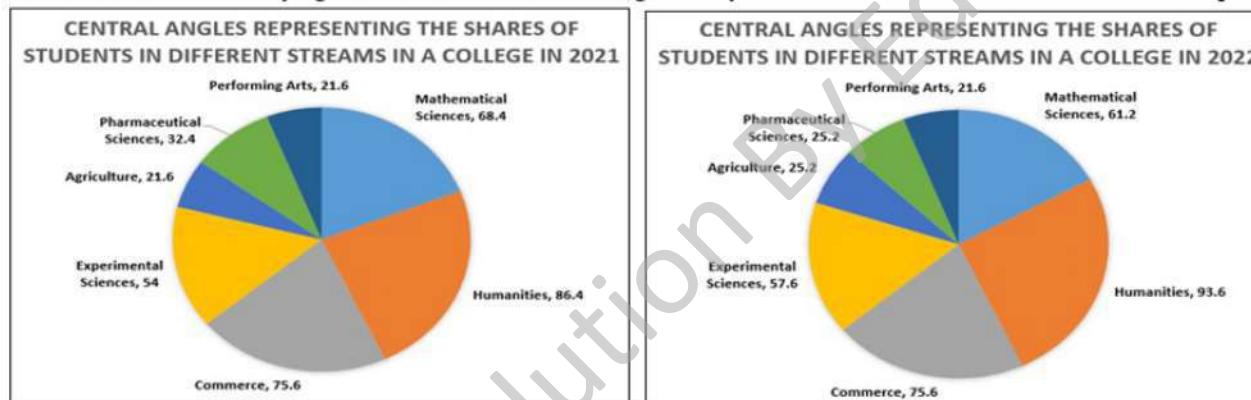
1. 45 cm 2. 35 cm 3. 30 cm 4. 40 cm

Q.11)- In a right-angled triangle PQR, PQ = 5 cm, QR = 13 cm and $\angle P = 90^\circ$. Find the value of $\tan Q - \tan R$.

1. $\frac{60}{119}$ 2. $\frac{14}{5}$ 3. $\frac{5}{14}$ 4. $\frac{119}{60}$

Q.12)-

The shares of students studying in different streams of a college in the years 2021 and 2022 are as reflected in the two pie charts given below.



The number of students opting for the pharmaceutical sciences in the college in 2022 was 180 more than the number of students opting for the pharmaceutical sciences in the college in 2021. The number of students opting for agriculture in the college in 2022 was 1380 more than the number of students opting for agriculture in the college in 2021.

What was the positive difference between the total number of students in the college in the years 2021 and 2022?

1. 15000 2. 13000 3. 14000 4. 13600

Q.13)- Compound interest on a certain sum of money invested for 1.5 years at the rate of 10% per annum, compounded half yearly is ₹5,044. What is the sum?

1. ₹37,044 2. ₹22,000 3. ₹33,000 4. ₹32,000

Q.14)- If $\operatorname{cosec}A + \cot A = a\sqrt{b}$, then find the value of $\frac{(a^2 b - 1)}{(a^2 b + 1)}$.

1. $\frac{1}{\cot A}$ 2. $\frac{1}{\sin A}$ 3. $\cos A$ 4. $\tan A$

Q.15)- Triangle ABC is an isosceles triangle with AB = AC. If angle BAC = 50° , then the degree measure of angle ABC is equal to:

1. 55° 2. 65° 3. 70° 4. 60°

Suhas, a tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Suhas and the building. The tree is located at a distance of 7.5 m from Suhas and at a distance of 45 m from the building. Further, the eyes of Suhas, the top of the tree, and the top of the building fall in one line, and the eyes of Suhas are at a height of 1.8 m from the ground. Find the height (in m) of the tree.

Q.16)- Simplify $(3x - 2y)(3x + 2y)(9x^2 + 4y^2)$.

1. $81y^4 - 16x^4$ 2. $81x^4 + 16y^4$ 3. $81y^4 + 16x^4$ 4. $81x^4 - 16y^4$

Q.17)- Simplify $(3x - 2y)(3x + 2y)(9x^2 + 4y^2)$.

1. $81y^4 - 16x^4$ 2. $81x^4 + 16y^4$ 3. $81y^4 + 16x^4$ 4. $81x^4 - 16y^4$

A and B are running on a circular track of length 1400 metres. The speed of A is 33 m/sec and the speed of B is 47 m/sec. They start from the same point at the same time in the opposite direction. After how much time will they meet for the second time?

Q.18)- If $p^2 - 4p - 1 = 0$, then the value of $p^2 + 3p + \frac{1}{p^2} - \frac{3}{p}$ is :

1. 38 sec 2. 32 sec 3. 33 sec 4. 35 sec

Q.19)- If $p^2 - 4p - 1 = 0$, then the value of $p^2 + 3p + \frac{1}{p^2} - \frac{3}{p}$ is :

1. 30 2. 65 3. 50 4. 40

Q.20)- A shopkeeper gives an additional concession of 5% on an item which is already discounted by 15% on the marked price. If the buyer pays ₹3,068.5 for the item, then find the marked price.

1. ₹3,800 2. ₹3,500 3. ₹3,780 4. ₹3,700

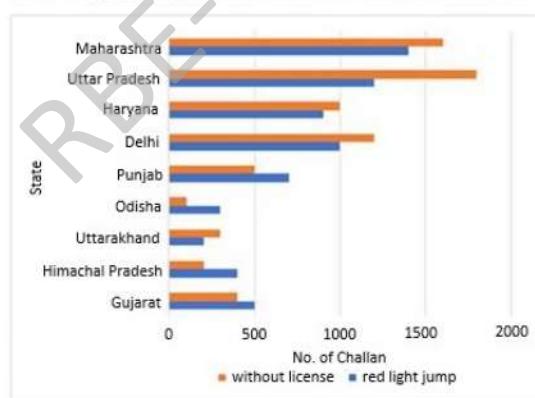
Q.21)- The value of $\left(\frac{2+7\times7+9\text{ of }9+6+6\times2}{4+4\text{ of }5+7\times7+7-6+4}\right)$ is:

1. $\frac{1865}{2106}$ 2. $\frac{1857}{2507}$ 3. $\frac{1664}{2305}$ 4. $\frac{1734}{2407}$

By driving the car at an average speed of 40 km per hour, I reach my destination in 7 hours. With what speed I can reach the same destination in 5 hours?

1. 56 km per hour 2. 50 km per hour 3. 55 km per hour 4. 65 km per hour

The bar graph represents the number of challan in 9 states of India.



What per cent is the number of challans in Maharashtra of the total number of challans with Himachal Pradesh and Odisha?

Q.23)-

1. 400% 2. 300% 3. 280% 4. 350%

An article is sold for ₹864 after two successive equal discounts of 25% each on its marked price. What is the discount (in ₹)?

- Q.24)- 1. 584 2. 672 3. 612 4. 698

A seller sold a bag at a profit of 12%. If he had sold it for ₹900 more, he would have gained 27%. What is the CP of the bag?

- Q.25)- 1. ₹6,000 2. ₹7,000 3. ₹5,560 4. ₹6,500

Answer key

Q.1	3	Q.2	1	Q.3	3	Q.4	4	Q.5	2
Q.6	1	Q.7	4	Q.8	3	Q.9	4	Q.10	1
Q.11	4	Q.12	3	Q.13	4	Q.14	3	Q.15	2
Q.16	4	Q.17	4	Q.18	4	Q.19	1	Q.20	1
Q.21	1	Q.22	1	Q.23	2	Q.24	2	Q.25	1

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By: Shubham Jain
(Selected as GST Inspector)
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17/08/2023-> (2:30 PM - 3:30 PM)

Q.1)- If $\cos\theta = \frac{4}{5}$, find the value of $\cot\theta + \tan\theta$.

- 1. $\frac{12}{25}$
- 2. $\frac{27}{12}$
- 3. $\frac{25}{12}$
- 4. $\frac{12}{27}$

Simplify the given expression.

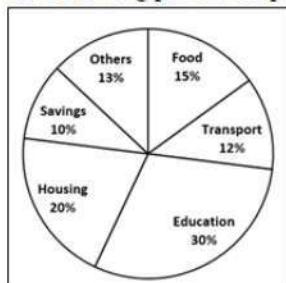
Q.2)- $\sqrt{\frac{1+\cos P}{1-\cos P}}$

- 1. cosec P + cot P
- 2. sec P + tan P
- 3. sec P - tan P
- 4. cosec P - cot P

Q.3)- It is given that $\triangle ABC \cong \triangle FDE$ and $AB = 5 \text{ cm}$, $\angle B = 40^\circ$ and $\angle A = 80^\circ$. Then which of the following is true?

- 1. DE = 5 cm, $\angle E = 60^\circ$
- 2. DF = 5 cm, $\angle E = 60^\circ$
- 3. DE = 5 cm, $\angle D = 40^\circ$
- 4. DF = 5 cm, $\angle F = 60^\circ$

The following pie chart represents the break-up of Piyush's monthly expenses.



Q.4)- If Piyush spent ₹3,780 more on education than he spent on housing, then find his monthly expenses (in ₹).

- 1. ₹12,600
- 2. ₹37,800
- 3. ₹7,560
- 4. ₹18,900

Q.5)- A mixture contains liquid A and B in the ratio 5 : 3, respectively. If 3 litres of liquid B is added to it, the ratio of liquid A to liquid B becomes 7 : 6. What is the quantity of liquid A in the mixture?

- 1. $7\frac{2}{3} \text{ litres}$
- 2. $11\frac{2}{3} \text{ litres}$
- 3. $9\frac{1}{3} \text{ litres}$
- 4. $13\frac{1}{3} \text{ litres}$

Q.6)- If $\sin\theta \cos\theta = \frac{1}{\sqrt{3}}$ then the value of $(\sin^4\theta + \cos^4\theta)$ is:

- 1. $\frac{5}{3}$
- 2. 1
- 3. $\frac{2}{3}$
- 4. $\frac{1}{3}$

Q.7)- A person bought two goods for ₹19,500. He sold one at a loss of 20% and the other at a profit of 15%. If the selling price of each goods is the same, find the cost price of goods sold at profit.

- 1. ₹9,750
- 2. ₹11,475
- 3. ₹8,000
- 4. ₹11,500

Simplify the given expression and find the value for $x = -1$.

$$\frac{10x^2 + 5x + 2xy + y}{5x + y}$$

Q.8)-

1. 2 2. -1 3. 1 4. 0

Study the given table and answer the question that follows.

The table shows the production of different varieties of rice (in quintals) from 2018-2021.

Variety	Year			
	2018	2019	2020	2021
A	20	35	55	67
B	45	45	89	87
C	67	89	67	98
D	34	65	76	78

Q.9)- In which year was rice of variety C produced the maximum?

1. 2019 2. 2021 3. 2018 4. 2020

A shopkeeper gives a discount of 15% on the marked price. If the selling price is ₹19,040, then the discount on it

Q.10)-

1. ₹3,260 2. ₹3,850 3. ₹3,360 4. ₹3,600

In a circular race of 1500 m, Anil and Bilal start from the same point and at the same time with speeds of 36 km/h and 54 km/h respectively. When will they meet again for the first time on the track when they are running in the same direction?

Q.11)-

1. 300 sec 2. 240 sec 3. 250 sec 4. 320 sec

If the marked price of a camera is ₹28,500 and a discount of 12% is given on it, then what is the selling price (in ₹) of the camera?

Q.12)-

1. 25,080 2. 22,753 3. 26,000 4. 25,270

Simplify the expression:

$$\frac{a+b}{a-b} \div \frac{(a+b)^2}{(a^2-b^2)}$$

Q.13)-

1. 0 2. 1 3. -1 4. $(a + b)$

Three men or five women can do a work in 57 days. In how many days can nine men and four women do that same work?

Q.14)-

1. 16 days 2. 14 days 3. 15 days 4. 18 days

Shailja allows a discount of 10% to her customer and still gains 20% on the sale of a cosmetic product. What is the marked price (in ₹) of the cosmetic product having cost price ₹450?

Q.15)-

1. 580 2. 560 3. 540 4. 600

Q.16)-

Divide ₹ 1488 among X, Y and Z. If the shares are in the ratio X: Y = 4:5, Y: Z = 7:6, then find out the share of Z.

1. ₹ 480 2. ₹ 450 3. ₹ 460 4. ₹ 470

The table shows the production of different types of P, Q, R and S motorcycles (in thousand) in four years.

Motorcycles	YEAR			
	2018	2019	2020	2021
P	92	98	102	128
Q	42	48	58	97
R	65	37	50	28
S	32	35	27	28

If the data related to the production of type R motorcycles is represented by Pie-Chart, then the central angle of the sector representing the production of motorcycles in 2020 will be:

- Q.17)- 1. 108° 2. 90° 3. 100° 4. 120°

Q.18)- If three angles of a triangle are $(2y + 40^\circ)$, $(5y - 60^\circ)$, and $(3y - 80^\circ)$, then what is the value of y ?

1. 28° 2. 30° 3. 24° 4. 26°

Simplify the expression:

$$\frac{143 \times 143 + 143 \times 139 + 139 \times 139}{143 \times 143 \times 143 - 139 \times 139 \times 139}$$

1. $\frac{1}{282}$ 2. $\frac{1}{4}$ 3. $\frac{1}{2}$ 4. $\frac{1}{4}$

Q.20)- The fourth proportional to 6, 8 and 12 is:

1. 12 2. 15 3. 16 4. 18

A solid sphere of radius 4 cm is melted and cast into the shape of a solid cone of height 4 cm. The radius of the base of the cone is _____.

1. 6 cm 2. 10 cm 3. 8 cm 4. 4 cm

65% of Samita's income is equal to 91% of Bhairav's income. If Samita's income was ₹1,500 more than what it is and Bhairav's income was ₹500 more than what it is, the ratio of the incomes of Samita and Bhairav would have been 3 : 2.

Q.22)- What is the actual combined income (in ₹) of Samita and Bhairav?

1. 18,500 2. 20,000 3. 17,500 4. 18,000

Two circles touch each other internally. Their radii are 3 cm and 4 cm. What is the length of the biggest chord of the circle with radii 4 cm which is outside the inner circle?

1. $5\sqrt{3}$ cm 2. $2\sqrt{3}$ cm 3. $6\sqrt{3}$ cm 4. $4\sqrt{3}$ cm

A man borrows ₹4,000 from a bank at 10% per annum simple interest and clears the debt in three years. If the installments paid at the end of the first, and second year to clear the debt are ₹1,500, and ₹2,500, respectively, what amount (in ₹) should be paid at the end of the third year to clear the debt?

1. 500 2. 550 3. 650 4. 700

Q.25)- Find the area of an equilateral triangle whose sides are 12 cm.

1. $36\sqrt{3}$ cm² 2. $35\sqrt{3}$ cm² 3. $34\sqrt{3}$ cm² 4. $38\sqrt{3}$ cm²

Answer key

Q.1	3	Q.2	1	Q.3	2	Q.4	2	Q.5	2
Q.6	4	Q.7	3	Q.8	2	Q.9	2	Q.10	3
Q.11	1	Q.12	1	Q.13	2	Q.14	3	Q.15	4
Q.16	1	Q.17	3	Q.18	1	Q.19	2	Q.20	3
Q.21	3	Q.22	4	Q.23	4	Q.24	3	Q.25	1

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$\triangle ABC$ inscribe in a circle with center O. if AB = 9 cm, BC = 40 cm and AC = 41 cm, then what is the circum-radius of a triangle?

- Q.1)-
1. $20\frac{1}{2}$ cm 2. $18\frac{1}{2}$ cm 3. $16\frac{1}{2}$ cm 4. $12\frac{1}{2}$ cm

A rod of 5 cm radius and 52 cm length is converted into a wire of 100 cm length of uniform thickness. The radius of the wire (in cm) is:

- Q.2)-
1. $\sqrt{13}$ 2. $\sqrt{23}$ 3. $\sqrt{17}$ 4. $\sqrt{15}$

What is the value of $(1 - \sin^2 A) \operatorname{cosec}^2 A$?

Q.3)- Given A is an acute angle.

1. $\sin^2 A$ 2. $\cos^2 A$ 3. $\cot^2 A$ 4. $\tan^2 A$

Q.4)- If $3x - 2y = 3$ and $xy = 9$, then find the value of $3x + 2y$.

1. 16 2. 15 3. 14 4. 13

Directions: The table below shows the laptop sold on different days by different wholesalers. Study the table and answer the questions that follow.

	Monday	Tuesday	Wednesday	Thursday	Friday
Wholesaler 1	22	20	14	24	10
Wholesaler 2	46	45	06	14	8
Wholesaler 3	18	40	07	15	19
Wholesaler 4	23	30	32	06	26

Q.5)- Laptop sold by wholesaler 1 and wholesaler 2 together on Thursday is what per cent of laptop sold by wholesaler 3 on Friday?

1. 200% 2. 100% 3. 150% 4. 50%

Two trains 320 m and 205 m in length are running towards each other on parallel lines. One train runs at the rate of 70 kmph and the other train runs at the rate of 56 kmph. Find the time they will take to cross each other (in seconds).

1. 15 2. 12 3. 20 4. 10

Q.7)- In 2021, Sam received an annual increment in his salary by 40% but due to recession in 2022, the company started taking cost-cutting measures and his salary was reduced by 15%. What was the net change in his salary?

1. 11% increase 2. 19% increase 3. 9% decrease 4. 17% increase

Q.8)- The perimeters of two similar triangles XYZ and PQR are respectively 62 cm and 42 cm. If PQ = 21 cm, find XY

1. 31 cm 2. 27 cm 3. 29 cm 4. 28 cm

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Study the table given below and answer the question that follows.

The table below shows the total number of students studying different subjects in a college and the percentage of boys and girls.

Subject	Number of Students	Percentage of Girls	Percentage of Boys
Hindi	110	60	40
English	70	50	50
Physics	50	30	70
Chemistry	40	80	20
Mathematics	80	20	80
Computers	90	40	60

Q.9)- What is the ratio of the total number of girls in all the subjects to that of boys in all the subjects?

1. 2 : 3
2. 5 : 6
3. 7 : 9
4. 6 : 7

If an electricity bill is paid before the due date, one gets a reduction of 13% on the amount of the bill. By paying

Q.10)- the bill before the due date, Ravi got a reduction of ₹260.39. The amount of his electricity bill (in ₹) was:

1. 2,230
2. 2,003
3. 2,064
4. 2,580

Simplify the following:

Q.11)- $18 \times [24 \div 70 \times \{25 \times 49 \div (5 \times 7)\}]$

1. 218
2. 215
3. 220
4. 216

Akash sold a motorcycle to Navin at a profit of 10%. Navin sold it to Vinay at a profit of 20%. Vinay sold it to Vishal at a

Q.12)- loss of 5%. If Vishal paid ₹62,700 for the motorcycle, then what was the cost of the motorcycle (in ₹) for Akash?

1. 48,500
2. 52,500
3. 48,000
4. 50,000

The compound interest accrued on a sum of ₹20,000 at the end of 2 years compounded annually is ₹2,050. Find
Q.13)- the compound interest at the end of the 3rd year.

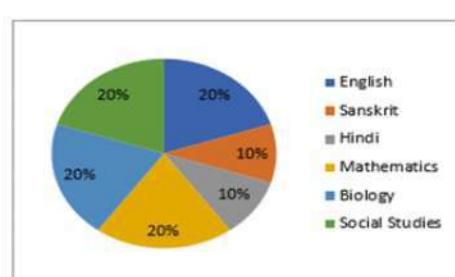
1. ₹3,154.50
2. ₹2,852.50
3. ₹3,152.50
4. ₹3,153.50

A can complete a task in the same time in which B and C work together. If A and B could complete it jointly in 10
Q.14)- days and C alone in 50 days, then B could complete it independently in:

1. 27 days
2. 26 days
3. 25 days
4. 23 days

Study the given pie-chart and answer the question that follows.

Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male and female teachers is 3 : 1.



Q.15)- Find the ratio of teachers in English, Sanskrit and Hindi to teachers in Mathematics, Biology and Social Studies.

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

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The radii of two circles are 9 cm and 4 cm, the distance between their centres is 13 cm, then the length of the direct common tangent is:

- Q.16)-** 1. 16 cm 2. 8 cm 3. 14 cm 4. 12 cm

- Q.17)-** If $\tan 15^\circ = 2 - \sqrt{3}$, then the value of $\tan 15^\circ \cot 75^\circ + \tan 75^\circ \cot 15^\circ$ is:

1. 6 2. 8 3. 14 4. 10

- Q.18)-** Find the value of $\tan(50+\theta) - \cot(40-\theta)$.

1. $\frac{1}{2}$ 2. 1 3. -1 4. 0

- Q.19)-** If $(y^2 + \frac{1}{y^2}) = 74$ and $y > 1$, find the value of $(y - \frac{1}{y})$.

1. $-6\sqrt{2}$ 2. $-2\sqrt{19}$ 3. $6\sqrt{2}$ 4. $2\sqrt{19}$

- Q.20)-** If $px + qy = 1$ and $qx + py = \frac{2pq}{p^2+q^2}$, then $(x^2 + y^2)(p^2 + q^2)$ is equal to:

1. 0 2. 1 3. 3 4. 2

If a sum of money at simple interest becomes 45 times in 110 years, then in how many years will that sum become 23

- Q.21)-** times?

1. 48 2. 60 3. 55 4. 50

- Q.22)-** Find the area of a right-angled triangle whose base is 12 cm and hypotenuse is 13 cm.

1. 22 cm^2 2. 55 cm^2 3. 65 cm^2 4. 30 cm^2

A salesman marks his goods 30% above the cost and gives a discount of 10% on them. Find his gain or loss

- Q.23)-** percentage.

1. Gain 7% 2. Gain 17% 3. Loss 17% 4. Loss 7%

A certain sum was to be divided between A and B in the ratio 8 : 5. However, by mistake, it was divided in the ratio 5 :

- Q.24)-** 8. Thus, A gets ₹300 less than his original share. Find the sum.

1. ₹1,500 2. ₹1,300 3. ₹2,600 4. ₹600

A 40-litre mixture of milk and water contains milk and water in the ratio of 7 : 3. How many litres of water should be

- Q.25)-** added to the mixture so that the resulting mixture has 60% of water in it?

1. 30 2. 20 3. 35 4. 25

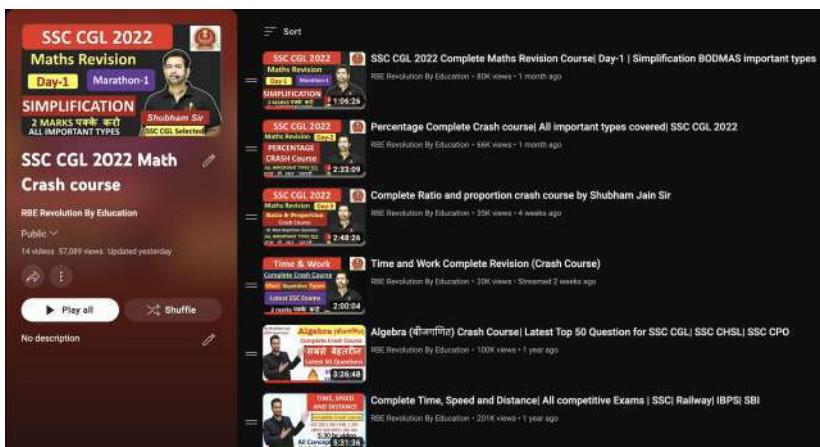
Answer key

Q.1	1	Q.2	1	Q.3	3	Q.4	2	Q.5	1
Q.6	1	Q.7	2	Q.8	1	Q.9	2	Q.10	2
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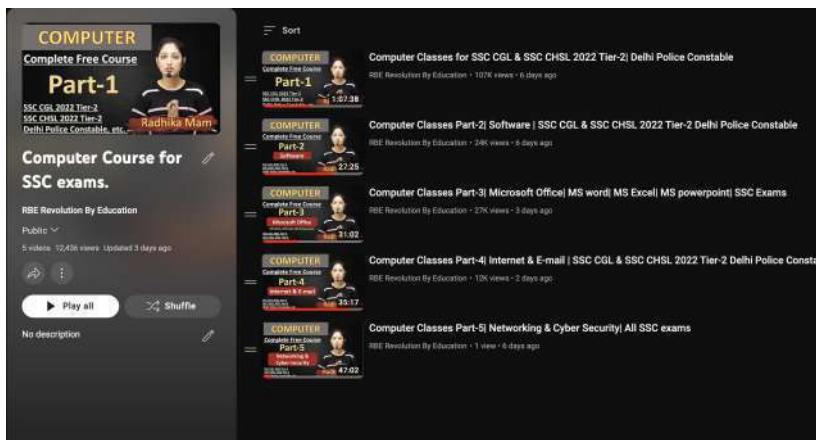
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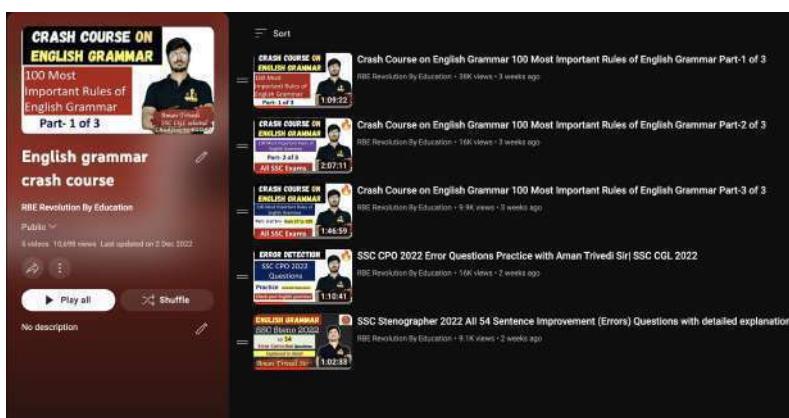
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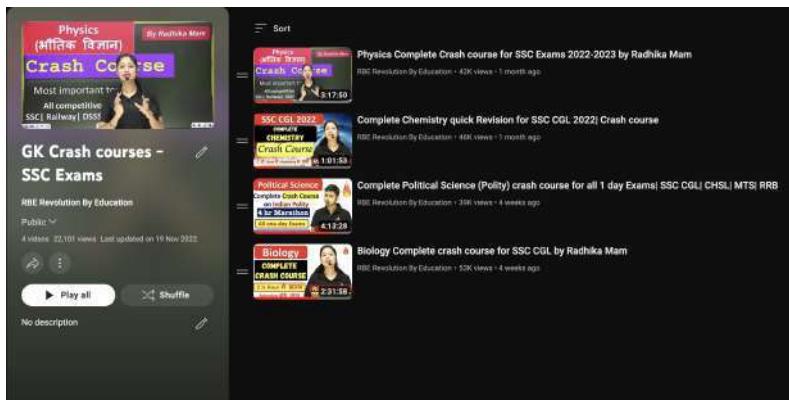
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