

SSC CGL Previous Year Question Paper 2017

Quantitative Aptitude (Questions and Solutions)

Q 1. After two successive discounts of 20% and 12% an article is sold for Rs 16896. What is the marked price (in Rs) of the article?

1. 21500
2. 23800
3. 22000
4. 24000

Answer: 4

Solution 1:

Let the marked price be x .

After the first discount of 20%, marked price = 80% of $x = 4/5x$

After the second discount of 12%, marked price = 88% of $4/5x$

So, according to the question, selling price = Rs. 16896

Therefore, 88% of $4/5x = 16896$

$$(88/100 \times 4/5)x = 16896$$

$$x = (16896 \times 125) / 88$$

$$x = 192 \times 125 = \text{Rs.}24000$$

Q 2. 5 years ago the average age of a family which includes father, mother and a son was 35 years. 3 years ago the average age of father and mother was 46 years. What is the present age (in years) of the son?

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

Answer: 2

Solution 2:

Let the present sum of ages of father and mother be x .

So three years ago, the sum of ages of father and mother = $(x-6)$ years

According to question,

$$(x-6) / 2 = 46$$

$$x - 6 = 92$$

$$x = 98$$

Let the present sum of ages of the father, mother and son be y .

So, 5 years ago, the sum of ages of the father, mother and son = $(y-15)$ years

According to the question,

$$(y-15) / 3 = 35$$

$$Y - 15 = 105$$

$$Y = 120$$

$$\text{Present age of son} = 120 - 98 = 22 \text{ years}$$

Q 3. 30% of a number exceeds 25% of the same number by 27. What is the value of the number?

1. 450
2. 650
3. 540
4. 340

Answer: 3

Solution 3:

Let the number be x

$$30\% \text{ of } x - 25\% \text{ of } x = 27$$

$$30/100 x - 25/100 x = 27$$

$$5x = 27 \times 100$$

$$x = 540$$

Q 4. Simple Interest received by a person in 10 years on a principal of Rs 9500 is 130% of the principal. What is the rate of interest (in %) per annum?

1. 11
2. 12
3. 19
4. 13

Answer: 4

Solution 4:

Time period = 10 years

Principal = Rs. 9500

Simple Interest = 130% of 9500 = Rs. 12350

Simple interest = $(P \times R \times T) / 100$

$12350 = (9500 \times R \times 10) / 100$

$R = (12350) / (95 \times 10)$

$R = 13\%$

Q 5. Mohit buys an old bicycle for Rs 2700 and spends Rs 500 on its repairs. If he sells the bicycle for Rs 3520, then what is his profit percentage?

1. 10
2. 12.5
3. 15
4. 20

Answer: 1

Solution 5:

Cost price of bicycle = Rs. $(2700+500) =$ Rs. 3200

Selling price of bicycle = Rs. 3520

profit% = $\{(S.P. - C.P.) / C.P.\} \times 100$

Profit% = $(320 / 3200) \times 100$

Profit % = 10%

Q 6. The average age of a team having 12 players is 23 years. If the age of the coach is also included, then the average age increases by 2 years. What is the age (in years) of the coach?

1. 41
2. 47
3. 49
4. 51

Answer: 3

Solution 6:

The average age of team having 12 players = 23 years

Sum of ages of all 12 players = $12 \times 23 = 276$ years

If the age of the coach is added, the sum of ages of 13 people = $25 \times 13 = 325$ years

Age of coach = $325 - 276 = 49$ years

Q 7. The flight fare between two cities is increased in the ratio 11:13. What is the increase (in Rs) in the fare, if the original fare was Rs 12100?

1. 14300
2. 2200
3. 22000
4. 1430

Answer: 2

Solution 7:

Original fare = Rs. 12100

$11x = 12100$

$x = 12100 / 11 = 1100$

New fare = $13x = 13 \times 1100 = \text{Rs. } 14300$

Increase in fare = $14300 - 12100 = 2200$

Q 8. If the diameter of a sphere is 14 cm, then what is the surface area (in cm^2) of the sphere?

1. 616 cm^2
2. 308 cm^2
3. 462 cm^2
4. 636 cm^2

Answer: 1

Solution 8:

The diameter of a sphere = 14 cm

Radius = $14 / 2 = 7\text{cm}$

The surface area of sphere = $4\pi r^2 = 4 \times (22/7) \times (7)^2 = 616 \text{ cm}^2$

Q 9. If $\sec^2 \theta + \tan^2 \theta = 5/3$, then what is the value of $\tan 2\theta$?

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

3. $1/\sqrt{3}$
4. Cannot be determined

Answer: 2

Solution 9:

$$\sec^2\theta + \tan^2\theta = 5/3$$

$$(1/\cos^2\theta) + (\sin^2\theta/\cos^2\theta) = 5/3$$

$$\{1+(1-\cos^2\theta)\} / \cos^2\theta = 5/3$$

$$(2 - \cos^2\theta) / \cos^2\theta = 5/3$$

$$6 - 3 \cos^2\theta = 5 \cos^2\theta$$

$$6 = 8 \cos^2\theta$$

$$3/4 = \cos^2\theta$$

$$\cos \theta = \sqrt{3}/2$$

$$\theta = \cos^{-1}(\sqrt{3}/2)$$

$$\theta = \cos 30^\circ$$

$$\theta = 30^\circ$$

$$\tan 2\theta = \tan (2 \times 30^\circ)$$

$$\tan 2\theta = \tan 60^\circ$$

$$\tan 2\theta = \sqrt{3}$$

Q 10. 3 numbers whose average is 112, the first number is 1/6th the sum of the other 2. What is the first number?

1. 45
2. 30
3. 15
4. 48

Answer: 4

Solution 10:

Let the three numbers be A, B and C.

$$A+B+C = 112 \times 3$$

$$A+B+C = 336$$

$$A = \frac{1}{6} (B+C)$$

$$B+C = 6A$$

$$A+6A = 336$$

$$7A = 336$$

$$A = 48$$

Q 11. A dealer sells two machines at Rs 12000 each. On one it gains 32% and on the other, it loses 32%. What is its profit/loss percentage in the whole transaction?

1. No gain and no loss
2. 1% loss
3. 18% profit
4. 10.24% loss

Answer: 1

Solution 11:

The cost price of two machines = Rs.12000 each

gain% in selling one machine = 32%

loss% in selling one machine = 32%

Selling price when profit of 32% occurred,

$$32 = \{(S.P-12000) / 12000\} \times 100$$

Selling price = Rs. 15840

Selling price when loss of 32% incurred,

$$32 = \{(12000-S.P.) / 12000\} \times 100$$

Selling Price = Rs. 8160

Total Cost Price = 12000+12000 = Rs.24000

Total Selling Price = 8160+15840 = Rs.24000

So since the total selling price and total cost price is the same. No profit/loss in the whole transaction.

Q 12. Rs 3200 is divided among A, B and C in the ratio of 3: 5: 8 respectively. What is the difference (in Rs) between the share of B and C?

1. 400
2. 600
3. 800
4. 900

Answer: 2

Solution 12:

Total amount = Rs.3200

A:B:C = 3:5:8

$$3x+5x+8x = 3200$$

$$16x = 3200$$

$$x = 200$$

$$\text{A's share} = 3 \times 200 = 600$$

$$\text{B's share} = 5 \times 200 = 1000$$

$$\text{C's share} = 8 \times 200 = 1600$$

$$\text{Difference between B and C's share} = 1600 - 1000 = 600$$

Q 13. The perimeter of an isosceles triangle is 32 cm and each of the equal sides is $\frac{5}{6}$ times of the base. What is the length of the two equal sides?

1. 10
2. 14
3. 17
4. 33

Answer: 1

Solution 13:

The perimeter of isosceles triangle = 32 cm

Let the length of the base be x

$$x + \frac{5}{6}x + \frac{5}{6}x = 32$$

$$\frac{16}{6}x = 32$$

$$x = 12$$

So, length of base = 12 cm

Length of two equal sides = 10 cm

Q 14. What is the area (in sq cm) of a rhombus if the lengths of its diagonals are 25 cm and 20 cm?

1. 500
2. 250
3. 125
4. 200

Answer: 2

Solution 14:

Length of diagonal 1 of rhombus = 25 cm

Length of diagonal 2 of rhombus = 20 cm

Area of rhombus = $(25 \times 20) / 2 = 250 \text{ cm}^2$

Q 15. If a saree is sold for Rs 1900 the seller will face 5% loss, at what price (in Rs) should he sell the saree to gain 15% profit?

1. 2200
2. 2400
3. 2500
4. 2300

Answer: 4

Solution 15:

Selling price of a saree = Rs.1900

Loss = 5%

$$5\% = (C.P - 1900) / C.P. \times 100$$

C.P. = Rs.2000

gain% = 15%

$$15 = (S.P - 2000) / 2000 \times 100$$

S.P = Rs. 2300

Q 16. If $7x - [3(2x - 3)]/2 = 1/2$, then what is the value of x?

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

Answer: 1

Solution 16:

$$7x - [3(2x - 3)]/2 = \frac{1}{2}$$

$$7x - \{(6x-9)/2\} = \frac{1}{2}$$

$$7x - 6/2x + 9/2x = \frac{1}{2}$$

$$(14x-6x)/2 = \frac{1}{2} - \frac{9}{2}$$

$$8/2x = -8/2$$

$$x = -1$$

Q 17. a, b and c are 3 values, such that $a + b = 5$, $b + c = 7.5$ and $c + a = 8.5$. What will be the average of these values?

1. 1.5
2. 3
3. 3.5
4. 4.5

Answer: 3

Solution 17:

$$a + b = 5$$

$$b + c = 7.5$$

$$c + a = 8.5$$

Adding all three together,

$$\Rightarrow a + b + b + c + c + a = 5 + 7.5 + 8.5$$

$$\Rightarrow 2(a+b+c) = 21$$

$$\Rightarrow a+b+c = 21/2$$

$$\Rightarrow a+b+c = 10.5$$

$$\Rightarrow (a+b+c)/3 = 10.5/3$$

$$\Rightarrow \text{average} = 1.5$$

Q 18. What is the fourth proportional to 24, 120 and 22?

1. 110
2. 120
3. 100
4. 90

Answer: 1

Solution 18:

$$24: 120:: 22: x$$

$$\Rightarrow x = (22 \times 120) / 24$$

$$\Rightarrow x = 110$$

Q 19. What is the area (in sq cm) of a circle whose circumference is 22 cm?

1. 77
2. 38.5
3. 44
4. 88

Answer: 2

Solution 19:

Circumference of a circle = 22cm

Therefore, $2\pi r = 22$

$$R = (22 \times 7) / (2 \times 22)$$

$$R = 3.5 \text{ cm}$$

$$\text{Area of circle} = \pi r^2 = 22/7 \times 3.5 \times 3.5 = 38.5 \text{ cm}^2$$

Q 20. When a number is increased by 120, it becomes 130% of itself. What is the number?

1. 400
2. 520
3. 460
4. 580

Answer: 1

Solution 20:

Let the number be x

According to question,

$$x + 120 = (130/100) x$$

$$x + 120 = (13/10) x$$

$$x = 40 \times 10$$

$$x = 400$$

Q 21. What is the value of 125% of 25% of 80?

1. 50

2. 25
3. 20
4. 40

Answer: 2

Solution 21:

$$\begin{aligned} &125\% \text{ of } 25\% \text{ of } 80 \\ &= (125/100) \times (25/100) \times 80 \\ &= 25 \end{aligned}$$

Q 22. If $9x - [5(2x + 1)/2] = 9/2$, then the value of x is?

1. $7/4$
2. $-7/4$
3. $4/7$
4. $-4/7$

Answer: 1

Solution 22:

$$9x - [5(2x + 1)/2] = 9/2$$

$$9x - [(10x+5)/2] = 9/2$$

$$9x - \{(10x+5) / 2\} = 9/2$$

$$18x - 10x - 5 = 9$$

$$8x - 5 = 9$$

$$8x = 14$$

$$x = 14/8$$

$$x = 7/4$$

Q 23. The value of $\tan 80^\circ \tan 10^\circ + \sin^2 70^\circ + \sin^2 20^\circ$ is

1. 0
2. 1
3. 2
4. $3/2$

Answer: 3

Solution 23:

Given Expression : $\tan(80^\circ)\tan(10^\circ)+\sin^2(70^\circ)+\sin^2(20^\circ)$

$$= \tan(80^\circ)\tan(90^\circ-80^\circ)+\sin^2(70^\circ)+\sin^2(90^\circ-70^\circ) \text{ ---- (1)}$$

By using the identity, $\tan(90^\circ-\theta)=\cot\theta$ and $\sin(90^\circ-\theta)=\cos\theta$

Substitute the above identity in (1)

$$= \tan(80^\circ)\cot(80^\circ)+\sin^2(70^\circ)+\cos^2(70^\circ)$$

$$= 1+1 \text{ [since, } (\sin^2\theta+\cos^2\theta=1) \text{ and } \tan\theta \cot\theta=1 \text{]}$$

$$=2$$

Q 24. If $\sin\theta + \cos\theta = 1$, then the $\sin\theta \cos\theta$ is equal to

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

Answer: 1

Solution 24:

Given,

$$\sin\theta + \cos\theta = 1$$

Square both the sides

$$(\sin\theta + \cos\theta)^2 = 1^2$$

$$\sin^2\theta + \cos^2\theta + 2\sin\theta \cos\theta = 1$$

$$\text{But, } \sin^2\theta + \cos^2\theta = 1$$

So,

$$1 + 2\sin\theta\cos\theta = 1$$

$$\text{Or, } 2\sin\theta\cos\theta = 0$$

$$\text{So, } \sin\theta \cos\theta = 0$$

Q 25. Given that $\tan(\theta + 15^\circ) = \sqrt{3}$. Then the value of θ is?

1. 15°
2. 75°
3. 45°
4. 65°

Answer: 3

Solution 25:

Given,

$$\tan(\theta + 15^\circ) = \sqrt{3}$$

We know,

$$\tan 60^\circ = \sqrt{3}$$

$$\text{So, } \theta + 15^\circ = 60^\circ$$

$$\text{Or, } \theta = 45$$

