



## SSC CGL Tier-2 4th-September-2011 Maths

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## SSC CGL Tier-2 4th-September-2011 Maths

### Instructions

For the following questions answer them individually

### Question 1

In division sum, the divisor is 4 times the quotient and twice the remainder. If  $a$  and  $b$  are respectively the divisor and the divided, then

A  $\frac{4a-a^2}{a} = 3$

B  $\frac{4a-a^2}{a}$

C  $(a+1)^2 = 4b$

D  $\frac{a(a+2)}{b} = 4$

Answer: D

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### Question 2

If 738A6A is divisible by 11, then the value of A is

A 6

B 3

C 9

D 1

Answer: C

### Explanation:

Sum of digits at odd places is  $7+8+6=21$ .

Sum of digits at even places is  $3+2A$ .

Their difference =  $21-(3+2A) = 18-2A$

The number will be divisible by 11 if  $18-2A$  is 11 or 0.

But to get to 11,  $2A$  needs to be 7 where it will give a fraction as a digit.

So  $18-2A = 0$ .

hence  $A = 9$

### Question 3

The product of two numbers is 1575 and their quotient is  $\frac{9}{7}$ . Then the sum of the numbers is

A 74

B 78

C 80

D 90

Answer: C

### Explanation:

given,  $x \cdot y = 1575$  and  $x/y = 9/7$ .

So  $x = 9y/7$

hence,  $(9y/7) \cdot y = 1575$

$y^2 = (7/9) \cdot 1575 = 1225$

$y = (+/-) 35$ .

If  $y = 35$ , then  $x = 1575/35 = 45$

. If  $y = -35$ , then  $x = -45$ .

So there are two solution sets, namely  $\{45, 35\}$  and  $\{-45, -35\}$

And according to the options, the ans will be 45, 35.

#### Question 4

The value of is  $\frac{(81)^{3.6} \times (9)^{2.7}}{(81)^{4.2} \times 3}$

A 3

B 6

C 9

D 8.2

Answer: C

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#### Question 5

$\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$  ..... is equal to

A 2

B 5

C 4

D 3

Answer: D

#### Question 6

The sum of the squares to two natural consecutive odd numbers is 394. The sum of the numbers is

A 24

B 32

C 40

D 28

Answer: D

**Explanation:**

Let first no. Be  $x$   
2nd no. will be  $x+2$   
 $x^2+(x+2)^2=394$   
 $x^2+x^2+4x+4=394$   
 $2x^2+4x=390$   
 $2(x^2+2x)=390$   
 $x^2+2x=195$   
 $x(x+2)=195$   
 $x+2=195/x$   
 $x=195/x-2$   
So no is 13 and 15

so the sum will be =  $13+15 = 28$

**Question 7**

When  $(67^{\text{th}} + 67)$  is divided by 68, the remainder is

- A 1
- B 63
- C 66
- D 67

Answer: C

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**Question 8**

A can do a piece of work in 24 days, B in 32 days and C in 64 days. All being to do it together, but A leaves after 6 days and B leaves 6 days before the completion of the work. How many days did the work last?

- A 15
- B 20
- C 18
- D 30

Answer: B

**Explanation:**

Number of days to complete the work

A = 24 days

B = 32 days

C = 64 days.

All worked together for 6 days, the fraction of the work that has been done is

$6/24 = 1/4$  by A

$6/32 = 3/16$  by B

$6/64 = 3/32$  by C.

Total fraction of work done in First 6 days =

$1/4 + 3/16 + 3/32$

$= (8 + 6 + 3) \div 32$

$$= 17/32.$$

$$\text{Fraction of work left} = 1 - 17/32 = 15/32.$$

Since B leaves 6 days before the completion of the work, it means that C works alone for 6 days. The fraction of work C does alone in those 6 days is

$$6/64 = 3/32.$$

Therefore fraction of work done before B's departure =

$$15/32 - 3/32 = 12/32$$

$$= 3/8.$$

Let X be the number of days in which B and C did 3/8 of the work.

Therefore,  $x/32$  is done by B and  $x/64$  is done by C.

This shows that

$$x/32 + x/64 = 3 \div 8$$

$$2x + x = 3 \times 8$$

$$3x = 24$$

$$x = 24 \div 3 = 8 \text{ days.}$$

Total number of days

$$= 6 + 8 + 6 = 20 \text{ days}$$

So, the answer would be option b) 20.

#### Question 9

The square root of  $1 - 0.75^{(0.75)^3} + [0.75 + (0.75)^2 + 1]$

A 1

B 2

C 3

D 4

Answer: B

#### Explanation:

let us consider 0.75 as x. then equation becomes

$$\sqrt{x^3 / (1 - x) + (x + x^2 + 1)}$$

$$= \sqrt{[x^3 + (1 - x)(x + x^2 + 1)] \div (1 - x)}$$

$$= \sqrt{[x^3 + (1 - x^3)] \div (1 - x)}$$

$$= \sqrt{1 \div (1 - x)}$$

If x is replaced by 0.75, we get

$$= \sqrt{1 \div 0.25}$$

$$= \sqrt{4}$$

$$= 2$$

#### Question 10

Given that  $\sqrt{4096} + \sqrt{40.96} + \sqrt{0.004096}$  is

- A 70.4
- B 70.464
- C 71.104
- D 71.4

**Answer: B**

**Explanation:**

$$\sqrt{4096} + \sqrt{40.96} + \sqrt{0.004096}$$

$$= 64 + 6.4 + .064 = 70.464$$

Hence option B

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**Question 11**

The least positive integer that should be subtracted from  $3011 \times 3012$  so that the different is a perfect square is

- A 3009
- B 2010
- C 3011
- D 3012

**Answer: C**

**Explanation:**

Given expression is  $3011 \times 3012$

If we consider  $a = 3011$ , we get  $a(a+1)$ . To make this a perfect square, we have to subtract it by  $a$ , then it becomes

$$a(a + 1) - a = a^2 + a - a = a^2$$

Therefore,  $3011 \times 3012$  will become a perfect square when it's subtracted by 3011.

**Question 12**

P, Q, R are employed to do a work for Rs.5750. P and Q together finished  $\frac{19}{23}$  of work AND Q and R together finished  $\frac{8}{23}$  of work. Wage of Q, in rupees, is

- A 2850
- B 3750
- C 2750
- D 1000

**Answer: D**

**Explanation:**

Given that P, Q & R are employed for a work of Rs.5750

i.e., wages for P, Q & R is  $P+Q+R = 5750$

Let's consider this total wages as  $x$

Given that P and Q together finished  $\frac{19}{23}$  of work

i.e., wages paid for P & Q is  $P+Q = \frac{19}{23}x = 4750$  ----(1)

Also, Given that Q and R together finished  $\frac{8}{23}$  of work

i.e., wages paid for Q & R is  $Q+R = \frac{8}{23}x = 2000$  ---- (2)

Adding equations (1) & (2), we get

$$\Rightarrow P+Q+Q+R = 4750+2000$$

$$\Rightarrow 5750+Q=6750$$

$$\Rightarrow Q=1000$$

### Question 13

While selling, a businessman allows 40% discount on the marked price and there is a loss of 30%. If it is sold at the marked price, profit percent will be

A 10%

B 20%

C  $16\frac{2}{3}$  %

D  $16\frac{1}{3}$  %

Answer: C

### Explanation:

Let the marked price be Rs 100. Let the Cost price be Rs x.

A/c to question ,a businessman allows 40% discount on the marked price and there is a loss of 30%,

$$60 = \frac{70}{100}x$$

$$x = \frac{600}{7}$$

If it is sold at marked price ,

$$\text{Profit} = 100 - \frac{600}{7} = \frac{100}{7}$$

$$\text{Profit \%} = \frac{\frac{100}{7}}{\frac{600}{7}} \times 100 = \frac{50}{3}$$

So, the answer would be option c)  $16\frac{2}{3}$  %

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### Question 14

A cistern has 3 pipes A, B and C. A and B can fill it in 3 and 4 hours respectively, and C can empty it in 1 hour. If the pipes are opened at 3 p.m., 4 p.m. and 5 p.m. respectively on the same day, the cistern will be empty at

A 7:12 p.m

B 7:15 p.m

C 7:10 p.m

D 7:18 p.m

Answer: A

### Explanation:

$$\text{part of the cistern filled by A in 2 hrs} = \frac{1}{3} \times 2 = \frac{2}{3}$$

part of cistern filled by B in 1 hr =  $\frac{1}{4}$

when all the pipes are opened, net part filled in 1 hr =  $\frac{1}{3} + \frac{1}{4} - 1 = \frac{4+3-12}{12} = \frac{5}{12}$

$\frac{5}{12}$  part is emptied per hour

time taken to empty  $\frac{11}{12}$  part =  $\frac{11}{12} \times \frac{12}{5} = \frac{11}{5}$  hrs

= 2 hrs 12 min

required time = 5 + 2 : 12 = 7 : 12 pm

#### Question 15

If A works alone, he would take 4 days more to complete the job than if both A and B worked together. If B worked alone, he would take 16 days more to complete the job than if A and B work together. How many days would they take to complete the work if both of them worked together?

A 10 days

B 12 days

C 6 days

D 8 days

Answer: D

#### Explanation:

let A and B together complete the work in x days

time taken by A = (x + 4) days

time taken by B = (x + 16) days

therefore  $\frac{1}{x+4} + \frac{1}{x+16} = \frac{1}{x}$

$$\frac{x+16+x+4}{(x+4)(x+16)} = \frac{1}{x}$$

$$\frac{2x+20}{x^2+16x+4x+64} = \frac{1}{x}$$

$$\frac{2x+20}{x^2+20x+64} = \frac{1}{x}$$

$$2x^2 + 20x = x^2 + 20x + 64$$

$$x^2 = 64$$

$$x = 8 \text{ days}$$

#### Question 16

250 men can finish a work in 20 days working 5 hours a day. To finish the work in 10 days working 8 hours a day, the minimum number of men required is

A 310

B 300

C 313

D 312

Answer: C

#### Explanation:

$$M_1 D_1 T_1 = M_2 D_2 T_2$$

given  $M_1 = 250$  men



D1 = 20 days

T1 = 5 hours

D2 = 10 days

T2 = 8 hours

M2 = ?

substituting

$$250 \times 20 \times 5 = M2 \times 10 \times 8$$

$$\text{solving } M2 = \frac{250 \times 20 \times 5}{10 \times 8} = 312.5$$

312.5 approximately equal to 313

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### Question 17

2 men and 5 women can be a work in 12 days. 5 men and 2 women can do that work in 9 days. Only 3 women can finish the same work in

A 36 days

B 21 days

C 30 days

D 42 days

Answer: A

### Explanation:

according to the question

$$(2m + 5w)12 = (5m + 2w)9$$

$$24m + 60w = 45m + 18w$$

$$\frac{w}{m} = \frac{21}{42} = \frac{1}{2}$$

$$\text{total work done} = (2 \times 2 + 5 \times 1) \times 12$$

$$= 9 \times 12 = 108$$

$$3 \text{ women can finish the same work in } 108 = 3 \times 1 \times t$$

solving t = 36 days

### Question 18

By selling an article at  $\frac{3}{4}$  th of the marked price, there is a gain of 25%. The ratio of the marked price and the cost price is

A 5:3

B 3:5

C 3:4

D 4:3

Answer: A

### Explanation:

let marked price, MP be 100

$$SP = \frac{3}{4} \times MP$$

$$= \frac{3}{4} \times 100$$

$$= 75$$

gain % = 25%

$$CP = 75 \times \frac{100}{125} = 60$$

$$\frac{MP}{CP} = \frac{100}{60} = \frac{5}{3}$$

#### Question 19

A and B are in the ratio 2 : 1. They spend in the ratio 5 : 3 and save in the ratio 4 : 1. If the total monthly savings of both A and B are Rs. 5,000, the monthly income of B is

A Rs. 7,000

B Rs. 14,000

C Rs. 5,000

D Rs. 10,000

**Answer: A**

#### Explanation:

A : B (savings ratio) = 4 : 1

total savings = 5000

A's savings = 4000

B's savings = 1000

income = expenditure + saving

$$\frac{2}{1} = \frac{5x+4000}{3x+1000}$$

solving

$$2(3x + 1000) = 5x + 4000$$

$$6x + 2000 = 5x + 4000$$

$$x = 2000$$

B's income = 1000 + 3x

$$= 1000 + 3 \times 2000$$

$$= 7000$$

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#### Question 20

The ratio of the sum of two numbers and their difference is 5 : 1. The ratio of the greater number to the smaller number is

A 2:3

B 3:2

C 5:1

D 1:5

**Answer: B**

#### Explanation:

let the 2 numbers be x and y

sum of 2 numbers = 5

$$x + y = 5 \dots\dots\dots(1)$$

difference of 2 numbers = 1

$$x - y = 1 \dots\dots\dots(2)$$

solving (1) and (2)

$$x = 3$$

substitute x in (1)

$$3 + y = 5$$

$$y = 2$$

ratio of the greater number to the smaller number is  $x : y = 3 : 2$

**Question 21**

**Successive discounts of 10%, 20% will be equivalent to a single discount is**

- A 28%
- B 32%
- C 64%
- D 56%

**Answer: A**

**Explanation:**

$$\text{successive discount of } x\% \text{ and } y\% = \left(x + y - \frac{xy}{100}\right)\%$$

here  $x\% = 10\%$

$y\% = 20\%$

$$\begin{aligned} \text{required discount} &= \left(20 + 10 - \frac{20 \times 10}{100}\right)\% \\ &= 28\% \end{aligned}$$

**Question 22**

**A retailer offers the following discount scheme for buyers on an article**

- I. Two successive discounts of 10%.
- II. A discount of 12% follows by a discount of 8%.
- III. Successive discounts of 15% and 5%
- IV. A discount of 20%.

- A I
- B II
- C III
- D IV

**Answer: D**

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**Question 23**

**A mixture contains 80% acid and rest water. Part of the mixture that should be removed and replaced by the same amount of water to make the ratio of acid and water 4 : 3 is**

- A  $\frac{1}{3}$  rd
- B  $\frac{3}{7}$  th
- C  $\frac{2}{3}$  rd
- D  $\frac{2}{7}$  th

**Answer:** D

**Explanation:**

let the quantity of mixture be 70 lt

therefore quantity of acid =  $70 \times \frac{80}{100} = 56$

after replacement the quantity of acid =  $\frac{70 \times 4}{7} = 40 \text{lt}$

therefore (56 - 40 = 16 lt) of acid is removed from the original mixture

let x lt of the mixture is removed and replaced by water

$$x \times \frac{80}{100} = 16$$

solving x = 20 lt

$$\text{required part of mixture} = \frac{20}{70} = \frac{2}{7}$$

**Question 24**

An employer reduces the number of his employees in the ratio 9 : 8 and increases their wages in the ratio 14 : 15. If the original wage was Rs, 18,900, find the ratio in which the wage bill is decreased

- A 20:21
- B 21:20
- C 20:19
- D 19:21

**Answer:** B

**Explanation:**

original number of employees = 9x

present number of employees = 8x

original wages = 14y

present wages = 15y

$$\text{let original wage bill} = 9x \times 14y = 126xy$$

$$\text{present wage bill} = 8x \times 15y = 120xy$$

$$\text{wage bill ratio original : present} = 126xy : 120xy = 21 : 20$$

thus wage bill decreased in the ratio 21 : 20

**Question 25**

The batting average for 40 innings of a cricketer is 50 runs. His highest score exceeds his lowest score by 172 runs. If these two innings are excluded, the average of the remaining 38 innings is 48 runs. The highest score of the player is

- A 165
- B 170

C 172

D 174

Answer: D

**Explanation:**

total runs scored by the player in 40 innings =  $40 \times 50 = 2000$

total runs scored by the player in 38 innings after excluding 2 innings =  $38 \times 48 = 1824$

sum of the scores of the excluded innings =  $2000 - 1824 = 176$

given that scores of the excluded innings differ by 172

hence lets take the highest score as  $x+172$  and lowest score as  $x$

now  $x+x+172 = 176$

$2x = 4$

$x = 2$

highest score =  $172+2 = 174$

## SSC CHSL Prevoius Papers (DOWNLOAD PDF)

**Question 26**

A and B are two alloys of gold and copper prepared by mixing metals in the ratio 7 : 2 and 7 : 11 respectively. If equal quantities of the alloys are melted to form a third alloy C, the ratio of gold and copper in C will be

A 5:7

B 5:9

C 7:5

D 9:5

Answer: C

**Explanation:**

ratio of gold and copper in A = 7 : 2

gold in A =  $\frac{7}{9}$

copper in A =  $\frac{2}{9}$

ratio of gold and copper in B = 7 : 11

gold in B =  $\frac{7}{18}$

copper in B =  $\frac{11}{18}$

If equal quantities of the alloys are melted to form a third alloy C

gold in C =  $\frac{7}{9} + \frac{7}{18} = \frac{21}{18}$

copper in C =  $\frac{2}{9} + \frac{11}{18} = \frac{15}{18}$

ratio of gold and copper in C = 21 : 15 = 7 : 5

**Question 27**

In a laboratory, two bottles contain mixture of acid and water in the ratio 2 : 5 in the first bottle and 7 : 3 in the second. The ratio in which the contents of these two bottles be mixed such that the new mixture has acid and water in the ratio 2:3 is

A 4:15

- B 9:8
- C 21:8
- D 1:2

Answer: C

**Explanation:**

ratio of acid and water in the first bottle = 2 : 5

acid in the first bottle =  $\frac{2}{7}$

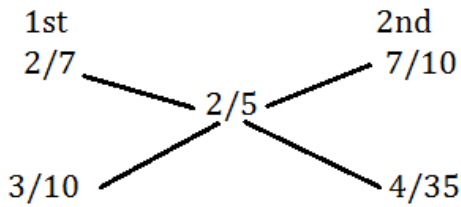
ratio of acid and water in the second bottle = 7 : 3

acid in the second bottle =  $\frac{7}{10}$

ratio of acid and water in the new mixture = 2 : 3

acid of new mixture =  $\frac{2}{5}$

using alligation method



ratio in which the contents of these two bottles be mixed =  $\frac{3}{10} : \frac{4}{35}$   
 $= 21 : 8$

**Question 28**

The average of the three numbers is 154. The first number is twice the second and the second number is twice the third. The first number is

- A 264
- B 132
- C 88
- D 66

Answer: A

**Explanation:**

let the 3 numbers be x,y,z

average of the three numbers is 154.

therefore sum of 3 numbers =  $154 \times 3 = 462$

that is  $x + y + z = 462$

first number is twice the second

$$x = 2y \dots\dots\dots (1)$$

second number is twice the third.

$$y = 2z \dots\dots\dots (2)$$

$$\text{from (1) } y = \frac{x}{2}$$

$$\text{from (2) } z = \frac{y}{2} = \frac{x}{4}$$

according to the question

$$x + \frac{x}{2} + \frac{x}{4} = 462$$

solving  $x = 264$

## General Science Notes for SSC CGL

### Question 29

The average salary of all the staff in an office of a corporate house is Rs. 5,000. The average salary of the officers is Rs. 14,000 and that of the rest is Rs. 4,000. If the total number of staff is 500, the number of officers is

- A 10
- B 15
- C 25
- D 50

**Answer:** D

#### Explanation:

total number of staff = 500

let the number of officers =  $x$

rest =  $500 - x$

given that average salary of the officers is Rs. 14,000

total salary of officers =  $14000x$

average salary of rest is 4000

total salary of rest =  $(500 - x)4000$

average salary of all the staff in an office of a corporate house is Rs. 5,000.

according to the question

$$\frac{14000x + (500 - x)4000}{500} = 5000$$

$$14000x + 2000000 - 4000x = 2500000$$

solving  $x = 50$

number of officers = 50

### Question 30

The average marks of 40 students in an English exam is 72. Later it is found that three marks 64, 62 and 84 were wrongly entered as 68, 65 and 73. The average after mistakes were rectified is

- A 70
- B 72
- C 71.9
- D 72.1

**Answer:** D

#### Explanation:

average marks of 40 students in an English exam is 72

total marks =  $72 \times 40 = 2880$

three marks 64, 62 and 84 were wrongly entered as 68, 65 and 73

average after mistakes were rectified

$$2880 - (68 + 65 + 73) + (64 + 62 + 84)$$

$$2880 - 206 + 210 = 2884$$

$$\text{Required average} = \frac{2884}{40} = 72.1$$

**Question 31**

Of three numbers, the second is thrice the first and the third number is three-fourth of the first. If the average of the three numbers is 114, the largest number is

- A 72
- B 216
- C 354
- D 26

**Answer: B**

**Explanation:**

let the three numbers be x,y,z

second is thrice the first

$$y = 3x \dots\dots\dots(1)$$

third number is three-fourth of the first

$$z = \frac{3}{4}x$$

average of the three numbers is 114

$$\text{sum of 3 numbers} = 114 \times 3 = 342$$

$$\text{that is } x + 3x + \frac{3}{4}x = 342$$

solving x = 72

$$y = 3x = 3 \times 72 = 216$$

$$z = \frac{3}{4}x = \frac{3}{4} \times 72 = 54$$

thus the largest number is 216

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**Question 32**

A car covers  $\frac{1}{5}$  of the distance from A to B at the speed at 8 km/hr,  $\frac{1}{10}$  of the distance at 25 km per hour and the remaining at the speed of 20 km per hour. Find the average speed of the whole journey.

- A 12.625 km/hr
- B 13.625 km/hr
- C 14.625 km/hr
- D 15.625 km/hr

**Answer: D**

**Explanation:**

$$\text{average speed} = \frac{\text{total distance}}{\text{total time}}$$

let the total distance be d



time taken by the car to cover  $\frac{1}{5}$  of the distance from A to B at the speed at 8 km/hr,  $t_1 = \frac{\frac{d}{5}}{8} = \frac{d}{5 \times 8} = \frac{d}{40}$

time taken by the car to cover  $\frac{1}{10}$  of the distance at 25 km per hour,  $t_2 = \frac{\frac{d}{10}}{25} = \frac{d}{25 \times 10} = \frac{d}{250}$

time taken by the car to cover remaining at the speed of 20 km per hour  $t_3$

remaining distance =  $1 - \left(\frac{1}{5} + \frac{1}{10}\right) = \frac{7}{10}$

$t_3 = \frac{\frac{7d}{10}}{20} = \frac{7d}{200}$

$average\ speed = \frac{d}{t_1 + t_2 + t_3}$

$$= \frac{d}{\frac{d}{40} + \frac{d}{250} + \frac{7d}{200}}$$

$$= \frac{d}{\frac{25d + 4d + 35d}{1000}} = \frac{d \times 1000}{64d} = 15.625$$

### Question 33

A jar contains 10 red marbles and 30 green ones. How many red marbles must be added to the jar so that 60% of the marbles will be red?

- A 25
- B 30
- C 35
- D 40

Answer: C

### Question 34

If a number multiplied by 25% of itself gives a number which is 200% more than the number, then the number is

- A 12
- B 16
- C 20
- D 24

Answer: A

### Explanation:

Let the no. be x

Then 25% of x =  $\frac{x}{4}$

200% more than the x =  $x + 2x = 3x$

$$\frac{(x^2)}{4} = 3x$$

$$x = 12$$

## SSC CHSL Free Mock Test

### Question 35

The value on an article depreciates every year at the rate of 10% of its value. If the present value of the article is Rs. 729, then its worth 3 years ago was

- A Rs. 1250

B Rs. 1000

C Rs. 1125

D Rs. 1200

**Answer: B**

**Explanation:**

let value of articles 3 years ago be  $x$

value on an article depreciates every year at the rate of 10% of its value

$$x \times \frac{90}{100} \times \frac{90}{100} \times \frac{90}{100} = 729$$

$$x = \frac{729 \times 100 \times 100 \times 100}{90 \times 90 \times 90} = 1000$$

**Question 36**

The price of onions has been increased by 50%. In order to keep the expenditure on onions the same the percentage of reduction in consumption has to be

A 50%

B  $33\frac{1}{3}\%$

C 33%

D 30%

**Answer: B**

**Explanation:**

$price \times consumption = expenditure \dots (1)$

assume initial price of onions be 100

initial consumption = 100

expenditure =  $100 \times 100 = 10000$

price of onions has been increased by 50% = 150

assume consumption as  $x$

expenditure remain constant as 10000

now substituting in (1)

$$100 \times 100 = 10000$$

$$150 \times x = 10000$$

$$x = \frac{10000}{150} = \frac{200}{3}$$

$$\text{new consumption} = \frac{200}{3}$$

$$\text{percentage of reduction in consumption} = \frac{100 - \frac{200}{3}}{100} \times 100 = 33\frac{1}{3}\%$$

**Question 37**

Walking at 3 km per hour, Pintu reaches his school 5 minutes late. If he walks at 4 km per hour he will be 5 minutes early. The distance of Pintu's school from his house is

A  $\frac{ab}{cd}$

B 2 kms

C  $2\frac{1}{2}$  Km

D 5 kms

**Answer: B**

**Explanation:**

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

let the distance between house and school be d

time = t

Walking at 3 km per hour, Pintu reaches his school 5 minutes late,  $3 = \frac{d}{t+5}$ .....(1)

If he walks at 4 km per hour he will be 5 minutes early,  $4 = \frac{d}{t-5}$ .....(2)

from (1) and (2)

$$3(t + 5) = 4(t - 5)$$

$$3t + 15 = 4t - 20$$

$$\text{solving, } t = 35 \text{ minutes} = \frac{35}{60} = \frac{7}{12} \text{ hours}$$

substitute  $t = \frac{7}{12}$  in (1)

$$3 = \frac{d}{\frac{7}{12} + 5}$$

solving d = 2 km

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### Question 38

Nitin bought some oranges at Rs. 40 a dozen and an equal number at Rs. 30 a dozen. He sold them at Rs. 45 a dozen and made a profit of Rs. 480. The number of oranges, he bought, was

A 48

B 60

C 72

D 84

**Answer: A**

**Explanation:**

let the number of oranges bought be  $(x + x) = 2x$  dozens

$$\text{total CP} = 40x + 30x = 70x$$

$$\text{total SP} = 45 \times 2x = 90x$$

$$\text{profit} = 90x - 70x = 20x$$

$$20x = 480$$

$$x = \frac{480}{20} = 24$$

$$\text{number of oranges bought} = 2 \times 24 = 48$$

### Question 39

A man buys two chairs for a total cost of Rs. 900. By selling one for  $\frac{4}{5}$  of its cost and the other for  $\frac{5}{4}$  of its cost, he makes a profit of Rs. 90 on the whole transaction. The cost of the lower priced chair is

- A RS.360
- B RS.400
- C RS.420
- D RS.300

**Answer:** D

**Explanation:**

man buys two chairs for a total cost of Rs. 900

assume cost of lower priced chair =  $x$

cost price of other chair =  $900 - x$

selling price of lower priced chair =  $\frac{4}{5}x$

selling price of other chair =  $\frac{5}{4} \times (900 - x)$

total CP = 900

total SP =  $\frac{4}{5}x + \frac{5}{4} \times (900 - x)$

SP - CP = PROFIT

$$\frac{4}{5}x + \frac{5}{4}(900 - x) - 900 = 90$$

$$\frac{16x + 25(900 - x)}{20} = 990$$

$$16x + 22500 - 25x = 990 \times 20$$

solving  $x = 300$

**Question 40**

By selling 100 oranges, a vendor gains the selling price of 20 oranges. His gain percent is

- A 20
- B 25
- C 30
- D 32

**Answer:** B

**Explanation:**

selling price of 100 oranges = cost price of 100 oranges = selling price of 20 oranges

selling price of 80 oranges = cost price of 100 oranges

$$\text{gain \%} = \frac{\text{difference}}{\text{sold}} \times 100$$

$$= \frac{100 - 80}{80} \times 100$$

$$= 25\%$$

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**Question 41**

60% of the cost price of an article is equal to 50% of its selling price. Then the percentage of profit or loss on the cost price is

- A 20% loss

B  $16\frac{2}{3}\%$

C 20% profit

D 10% loss

Answer: C

**Explanation:**

60% of the cost price of an article is equal to 50% of its selling price

$$\frac{60}{100} \times CP = \frac{50}{100} \times SP$$

$$\frac{SP}{CP} = \frac{60 \times 100}{100 \times 50} = \frac{6}{5}$$

$$\text{profit \%} = \frac{1}{5} \times 100 = 20\%$$

**Question 42**

Maninder bought two horses at Rs.40,000 each. He sold one horse at 15% gain, but had to sell the second horse at a loss. If he had suffered a loss of Rs. 3,600 on the whole transaction, then the selling price of the second horse is

A Rs. 30,000

B Rs. 30,200

C Rs. 30,300

D Rs. 30,400

Answer: D

**Explanation:**

Maninder bought two horses at Rs.40,000 each.

cost price of 2 horses = 80000

sold one horse at 15% gain,

$$\text{SP of 1 horse} = 40000 \times \frac{115}{100} = 46000$$

SP of 2nd horse = x

total SP = 46000 + x

loss = 3600

CP - SP = LOSS

$$80000 - 46000 - x = 3600$$

$$34000 - x = 3600$$

$$34000 - 3600 = x$$

$$x = 30400$$

**Question 43**

A fruit-seller buys x guava for Rs. y and sells y guavas for Rs. x. If  $x > y$ , then he made

A  $\frac{x^2 - y^2}{xy}$  % loss

B  $\frac{x^2 - y^2}{xy}$  % gain

C  $\frac{x^2 - y^2}{y^2}$  % loss

D  $\frac{x^2 - y^2}{y^2}$  % gain

Answer: D

Explanation:

let he buys  $xy$  guavas

CP of  $x$  guava =  $y$

CP of  $xy$  guavas =  $y^2$

SP of  $y$  guava =  $x$

SP of  $xy$  guavas =  $x^2$

gain % =  $\frac{x^2 - y^2}{y^2} \times 100$

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### Question 44

. If the simple interest on Rs.  $x$  at a rate of  $a\%$  for  $m$  years is same as that on Rs  $y$  at a rate of  $a^2\%$  for  $m^2$  years, then  $x : y$  is equal to

A  $m:a$

B  $am:1$

C  $\frac{1}{m} : \frac{1}{a}$

D  $\frac{1}{am} : 1$

Answer: B

Explanation:

simple interest =  $\frac{PNR}{100}$

SI on Rs  $x$  =  $\frac{x \times a \times m}{100}$

SI on Rs  $y$  =  $\frac{y \times a^2 \times m^2}{100}$

according to question

$$\frac{x \times a \times m}{100} = \frac{y \times a^2 \times m^2}{100}$$

$$\frac{x}{y} = \frac{100 \times a^2 \times m^2}{100 \times a \times m} = \frac{am}{1}$$

### Question 45

A took two loans altogether for Rs. 1200 from B and C. B claimed 14% simple interest per annum, while C claimed 15% per annum. The total interest paid by A in one year was Rs. 172. Then, A borrowed

A Rs. 800 from C

B Rs. 625 from C

C Rs. 400 from B

D Rs. 800 from B

Answer: D

Explanation:

let money borrowed from B =  $x$

money borrowed from C =  $1200 - x$

B claimed 14% simple interest in 1 year  $SI = \frac{x \times 14 \times 1}{100}$

C claimed 15% simple interest in 1 year  $SI = \frac{(1200 - x) \times 15}{100}$

total interest =  $\frac{x \times 14}{100} + \frac{(1200 - x) \times 15}{100} = 172$

$$\frac{14x + 15 \times 1200 - 15x}{100} = 172$$

$$18000 - x = 17200$$

$$x = 800$$

#### Question 46

If a regular polygon has each of its angles equal to  $\frac{3}{5}$  times of two right angles, then the number of sides is

A 3

B 5

C 6

D 8

Answer: B

#### Explanation:

regular polygon has each of its angles equal to  $\frac{3}{5}$  times of two right angles =  $\frac{3}{5} \times 180 = 108^\circ$

formula for finding number of sides,  $n = \frac{(n-2) \times 180}{n}$

substituting,

$$108 = \frac{(n-2) \times 180}{n}$$

solving

$$108n = 180n - 360$$

$$360 = 72n$$

$$n = 5$$

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#### Question 47

A square is of area 200 sq. m. A new square is formed in such a way that the length of its diagonal is  $\sqrt{2}$  times of the diagonal of the given square. Then the area of the new square formed is

A  $200\sqrt{2}$  sq.m

B  $400\sqrt{2}$ sq.m

C 400 sq.m

D 800 sq.m

Answer: C

#### Explanation:

area of square =  $side^2 = 200$

$$side a = \sqrt{200} = 10\sqrt{2}$$

$$diagonal = \sqrt{2}a = \sqrt{2} \times 10 \times \sqrt{2} = 20$$

A new square is formed in such a way that the length of its diagonal is  $\sqrt{2}$  times of the diagonal of the given square

therefore diagonal of the new square =  $\sqrt{2} \times 20$

$$\sqrt{2} \times 20 = \sqrt{2}a$$

solving  $a = 20$

therefore area of new square =  $20^2 = 400$

#### Question 48

The heights of a cone, cylinder and hemisphere are equal. If their radii are in the ratio 2:3:1, then the ratio of their volumes is

- A 2 : 9 : 2
- B 4 : 9 : 1
- C 4 : 27 : 2
- D 2 : 3 : 1

**Answer:** C

#### Explanation:

heights of a cone = height of cylinder = radius of hemisphere =  $r$  units = 1

$$\text{volume of cone} = \frac{1}{3} \pi r^2 h$$

$$\text{volume of cylinder} = \pi r^2 h$$

$$\text{volume of hemisphere} = \frac{2}{3} \pi r^3$$

$$\text{ratio of their volumes} = \frac{1}{3} \pi r^2 h : \pi r^2 h : \frac{2}{3} \pi r^3$$

$$= \frac{1}{3} \times \pi \times 4 \times 1 : \pi \times 9 \times 1 : \frac{2}{3} \times \pi \times 1$$

$$= \frac{4}{3} : 9 : \frac{2}{3}$$

$$= 4 : 27 : 2$$

#### Question 49

A motor-boat can travel at 10 km/hour in still water. It travelled 91 km downstream in a river and then returned to the same place, taking altogether 20 hours. Find the rate of flow of river

- A 3 km/hour
- B 4 km/hour
- C 2 km/hour
- D 5 km/hour

**Answer:** A

#### Explanation:

motor-boat can travel at 10 km/hour in still water

distance covered in upstream and downstream = 91 km

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

given, rate of still water = 10 km/hr

assume rate of stream =  $x$

then downstream speed =  $x + 10$

upstream speed =  $x - 10$

total time = 20 hrs



according to the question

$$20 = \frac{91}{10-x} + \frac{91}{10+x}$$

solving,  $x = 3$  km/hr

## SSC CGL Previous Papers (DOWNLOAD PDF)

### Question 50

A man driving at  $\frac{3}{4}$  th of his original speed reaches his destination 20 minutes later than the usual time. Then the usual time is

- A 45 minutes
- B 60 minutes
- C 48 minutes
- D 120 minutes

Answer: B

### Question 51

A motor boat, travelling at the same speed, can cover 25 km upstream and 39 km downstream in 8 hours . At the same speed it can travel 35 km upstream and 52 km downstream in 11 hours . The speed of the stream is

- A 2 km/hr
- B 3 km/hr
- C 4 km/hr
- D 5 km/hr

Answer: C

### Explanation:

let speed of still water =  $x$  km/hr

speed of stream =  $y$  km/hr

According to the question,

$$\frac{25}{x-y} + \frac{39}{x+y} = 8 \dots\dots\dots(1)$$

$$\frac{35}{x-y} + \frac{52}{x+y} = 11 \dots\dots\dots(2)$$

solving (1) and (2)

$$x = 9$$

$$y = 4$$

therefore speed of stream = 4 km/hr

### Question 52

If a sum of money placed at compound interest, compound annually, doubles itself in 5 years, then the same amount of money will be 8 times of itself in

- A 25
- B 20
- C 15

D 10

Answer: C

Explanation:

Let the principal be P

If the principal is doubled in 5 years

Then C.I = P in 5 years

$$\text{Amount} = P(1+r\%/100)^t$$

$$2P = P(1+r\%/100)^5$$

$$(1+r\%/100)^5 = 2$$

$$\text{Then, } 8P = P(1+r\%/100)^t$$

$$8 = \{(1+r\%/100)^5\}^t/5$$

$$2^3 = 2^{(t/5)}$$

$$3 = t/5$$

$$t = 15$$

## SSC CGL Tier-2 Previous Papers PDF

Question 53

A person has left an amount of Rs. 1,20,000 to be divided between his two sons ages 14 years and 12 years such that they get equal amounts when each attains 18 years of age. If the amount gets a simple interest of 5% per annum, the younger son's share at present is

A Rs. 48,800

B Rs. 57,600

C Rs. 62,800

D Rs. 84,800

Answer: B

Explanation:

let younger son's share = x

elder son's share = (120000 - x)

according to the question,

$$x + \frac{x \times 5 \times 6}{100} = (120000 - x) + \frac{(120000 - x) \times 4 \times 5}{100}$$

$$20x + 6x = 20 \times 120000 - 20x + 480000 - 4x$$

$$\text{solving } x = \frac{2880000}{50} = 57600$$

Question 54

If  $a^2 + b^2 + c^2 = 2(a - b - c) - 3$ , then the value of (a - b + c) is

A -1

B 3

C 1

D -2

Answer: C

Question 55

If  $x^2 + 3x + 1 = 0$ , then the value of  $x^3 + \frac{1}{x^3}$

- A -18
- B 18
- C 36
- D -36

Answer: A

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Question 56

If  $x^a \cdot x^b \cdot x^c = 1$  then the value of  $a^3 + b^3 + c^3$  is

- A 9
- B abc
- C a+b+c
- D 3abc

Answer: D

Question 57

Base of a right pyramid is a square, length of diagonal of the base is  $24\sqrt{2}$  m. If the volume of the pyramid is 1728 cu.m. its height is

- A 7
- B 8
- C 9
- D 10

Answer: C

Explanation:

$$\begin{aligned} \text{area of the base} &= \frac{1}{2} \times (\text{diagonal})^2 \\ &= \frac{1}{2} \times 24\sqrt{2} \times 24\sqrt{2} = 576 \text{ cm}^2 \end{aligned}$$

$$\text{volume of the pyramid} = \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$1728 = \frac{1}{3} \times h \times 576$$

$$h = \frac{1728 \times 3}{576} = 9 \text{ m}$$

Question 58

The height of a right circular cone and the radius of its circular base are respectively 9 cm and 3 cm. The cone is cut by a plane parallel to its base so as to divide it into two parts. The volume of the frustum (i.e., the lower part) of the cone is 44 cubic cm. The radius of the upper circular surface of the frustum (taking  $\pi = \frac{22}{7}$ ) is

A  $\sqrt[3]{12}$  cm

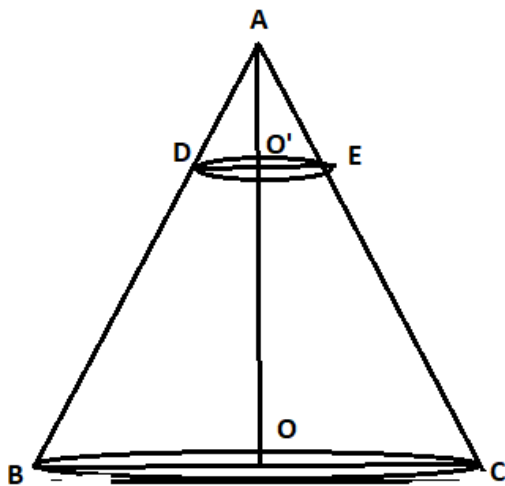
B  $\sqrt[3]{13}$  cm

C  $\sqrt[3]{6}$  cm

D  $\sqrt[3]{20}$  cm

Answer: B

Explanation:



let  $DO' = r$  cm

$OO' = h$  cm

triangle  $ADO'$  and  $ABO$  are similar

therefore  $\frac{AO'}{AO} = \frac{DO'}{BO}$

$$\frac{9-h}{9} = \frac{r}{3}$$

$$9 - h = 3r$$

$$h = 9 - 3r$$

$$\text{volume of frustum} = \frac{1}{3} \pi h (r^2 + r^2 + r \cdot 3r)$$

$$44 = \frac{1}{3} \times \frac{22}{7} \times (9 - 3r)(9 + r^2 + 3r)$$

$$44 = \frac{1}{3} \times \frac{22}{7} \times 3(3 - r)(r^2 + 3r + 3^2)$$

$$44 = \frac{22}{7} (3 - r)(r^2 + 3r + 3^2)$$

$$44 = \frac{22}{7} (3^3 - r^3)$$

$$14 = 27 - r^3$$

$$r^3 = 13$$

$$r = \sqrt[3]{13}$$

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### Question 59

The ratio of radii of two right circular cylinders is 2 : 3 and their heights are in the ratio 5 : 4. The ratio of their curved surface area is

A 5:6

- B 3:4  
C 4:5  
D 2:3

**Answer: A**

**Explanation:**

ratio of radii of two right circular cylinders  $r_1, r_2$  is 2 : 3

heights  $h_1, h_2$  are in the ratio 5 : 4

curved surface area (C S A) =  $2\pi rh$

$$\frac{CSA_1}{CSA_2} = \frac{2\pi r_1 h_1}{2\pi r_2 h_2} = \frac{r_1 h_1}{r_2 h_2} = \frac{2 \times 5}{3 \times 4} = \frac{5}{6}$$

**Question 60**

A solid cylinder has total surface area of 462 sq. cm. Curved surface area is  $\frac{1}{3}$  rd of its total surface area. What is the volume of the cylinder

- A  $530 \text{ cm}^3$   
B  $536 \text{ cm}^3$   
C  $539 \text{ cm}^3$   
D  $545 \text{ cm}^3$

**Answer: C**

**Explanation:**

curved surface area (C S A) is  $\frac{1}{3}$  rd of its total surface (T S A) area

$$C S A = \frac{T S A}{3}$$

$$C S A = \frac{462}{3} = 154$$

$$\text{rest of area} = 462 - 154 = 308$$

$$\text{base area} = 2\pi r^2 = 308$$

$$2 \times \frac{22}{7} \times r^2 = 308$$

solving,  $r = 7$

$$2\pi rh = 154$$

$$2 \times \frac{22}{7} \times 7 \times h = 154$$

solving  $h = \frac{7}{2}$

$$\text{volume} = \pi r^2 h$$

$$= \frac{22}{7} \times 7^2 \times \frac{7}{2} = 539$$

**Question 61**

A cylinder and a cone have equal radii of their bases and equal heights. If their curved surface areas are in the ratio 8 : 5, the ratio of their radius and height is

- A 1:2  
B 1:3  
C 2:3

D 3:4

Answer: D

Explanation:

$$\frac{\text{curved surface area of cylinder}}{\text{curved surface area of cone}} = \frac{8}{5}$$

$$\frac{2\pi rh}{\pi r\sqrt{h^2+r^2}} = \frac{8}{5}$$

$$\frac{h}{\sqrt{h^2+r^2}} = \frac{4}{5}$$

on squaring both sides

$$\frac{h^2}{h^2+r^2} = \frac{16}{25}$$

$$1 + \frac{r^2}{h^2} = \frac{25}{16}$$

$$\frac{r^2}{h^2} = \frac{9}{16}$$

$$\frac{r}{h} = \frac{3}{4}$$

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Question 62

A solid is hemispherical at the bottom and conical above. If the surface areas of the two parts are equal, then the ratio of radius and height of its conical part is

A 1:3

B 1:1

C  $\sqrt{3} : 1$

D  $1 : \sqrt{3}$

Answer: D

Explanation:

let the radius of base = r

height of cone = h

$$2\pi r^2 = \pi r\sqrt{r^2+h^2} + \pi r^2$$

$$2r = \sqrt{r^2+h^2} + r$$

$$4r^2 = r^2 + h^2$$

$$3r^2 = h^2$$

$$h = \sqrt{3}r$$

$$\frac{r}{h} = \frac{1}{\sqrt{3}}$$

Question 63

Base of a right prism is an equilateral triangle of side 6 cm. If the volume of the prism is  $108\sqrt{3}$  cc. its height is

A 9 cm

B 10 cm

C 11 cm

D 12 cm

Answer: D

Explanation:

$$\begin{aligned}\text{area of the base} &= \frac{\sqrt{3}}{4} \times \text{side}^2 \\ &= \frac{\sqrt{3}}{4} \times 6 \times 6 \\ &= 9\sqrt{3}\text{cm}^2\end{aligned}$$

therefore, volume of the prism =  $\text{area of base} \times \text{height}$

$$108\sqrt{3} = 9\sqrt{3} \times h$$

$$\text{solving } h = \frac{108\sqrt{3}}{9\sqrt{3}} = 12$$

Question 64

If  $a + \frac{1}{a} = 2$  then the value of  $a^{37} - \frac{1}{a^{100}}$

A 0

B -2

C 1

D 2

Answer: B

## SSC CGL Important Questions PDF

Question 65

The value of  $k$  for which the graph of  $(k-1)x + y - 2 = 0$  and  $(2-k)x - 3y + 1 = 0$  are parallel is

A  $\frac{1}{2}$

B  $-\frac{1}{2}$

C 2

D -2

Answer: A

Question 66

The length of a shadow of a vertical tower is  $\frac{1}{\sqrt{3}}$  times its height. The angle of elevation of the Sun is

A  $30^\circ$

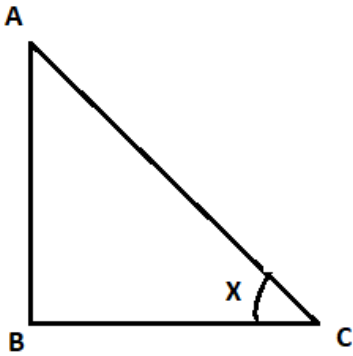
B  $45^\circ$

C  $60^\circ$

D  $90^\circ$

Answer: C

Explanation:



let AB be the tower and BC be its shadow

assume  $AB = x$

then  $BC = \frac{x}{\sqrt{3}}$

$$\tan \theta = \frac{AB}{BC} = x \times \frac{\sqrt{3}}{x} = \sqrt{3}$$

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

$$\theta = 60^\circ$$

Question 67

The graph of  $x + 2y = 3$  and  $3x - 2y = 1$  meet the Y-axis at two points having distance

A  $\frac{8}{3}$  units

B  $\frac{4}{3}$  units

C 1 units

D 2 units

Answer: D

Explanation:

on Y axis,  $x=0$

put  $x = 0$  in  $x+2y = 3$

$$2y = 3$$

$$y = \frac{3}{2}$$

putting  $x=0$  in  $3x-2y = 1$

$$-2y = 1$$

$$y = -\frac{1}{2}$$

therefore points on Y-axis are

$$\left(0, \frac{3}{2}\right) \text{ and } \left(0, -\frac{1}{2}\right)$$

$$\text{required distance} = \sqrt{(0-0)^2 + \left(\frac{3}{2} + \frac{1}{2}\right)^2}$$

$$= \sqrt{(0+4)} = 2 \text{ units}$$



Question 68

if  $x + \frac{1}{16x} = 1$ , then the value of  $64x^3 + \frac{1}{64x^3}$

- A 4
- B 52
- C 64
- D 76

Answer: B

Question 69

If a, b, c are three non-zero real numbers such that  $a + b + c = 0$ , and  $b^2 = ca$ , then the value of  $\frac{a^2 + b^2 + c^2}{b^2 - ca}$  is

- A 3
- B 2
- C 0
- D 1

Answer: B

Question 70

If  $a^4 + a^2b^2 + b^4 = 8$  and  $a^2 + ab + b^2 = 4$ , then the value of  $ab$  is

- A -1
- B 0
- C 2
- D 1

Answer: D

**General Science Notes for SSC CGL**

Question 71

If  $a = 25, b = 15, c = -10$ , then the value of  $\frac{a^3 + b^3 + c^3 - 3abc}{(a-b)^2 + (b-c)^2 + (c-a)^2}$  is

- A 30
- B -15
- C -30
- D 15

Answer: D

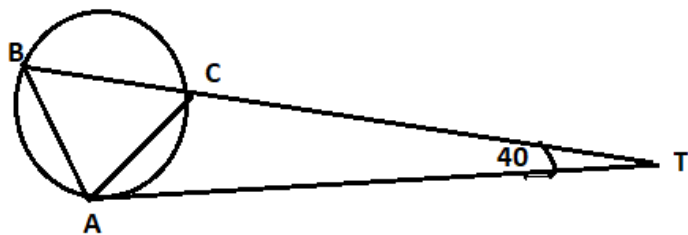
Question 72

A, B, C are three points on a circle. The tangent at A meets BC produced at T,  $\angle BTA = 40^\circ$ ,  $\angle CAT = 44^\circ$ . The angle subtended by BC at the centre of the circle

- A  $84^\circ$
- B  $92^\circ$
- C  $96^\circ$
- D  $104^\circ$

Answer: D

Explanation:



$$\angle CAT = 44^\circ \text{ (given)}$$

$$\angle BTA = 40^\circ \text{ (given)}$$

$$\angle ACT = 180 - 44 - 40 = 96^\circ$$

$$\angle CAT = \angle CBA = 44^\circ \text{ (alternate theorem)}$$

$$\angle BCA = 180 - 96 = 84$$

$$\text{therefore, } \angle BAC = 180 - 84 - 44 = 52^\circ$$

$$\text{therefore, angle subtended by BC at the centre} = 2 \times 52 = 104^\circ$$

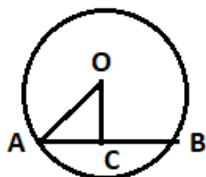
Question 73

If the length of a chord of a circle at a distance of 12 cm from the centre is 10 cm, then the diameter of the circle is

- A 13 cm
- B 15 cm
- C 26 cm
- D 30 cm

Answer: C

Explanation:



$$\text{given, } OC = 12 \text{ cm}$$

$$AC = CB = 5 \text{ cm [line drawn through the centre of a circle bisects a chord]}$$

$$\text{therefore, radius } OA = \sqrt{OC^2 + AC^2}$$

$$= \sqrt{12^2 + 5^2}$$

$$= \sqrt{169} = 13\text{cm}$$

diameter =  $2 \times 13 = 26$

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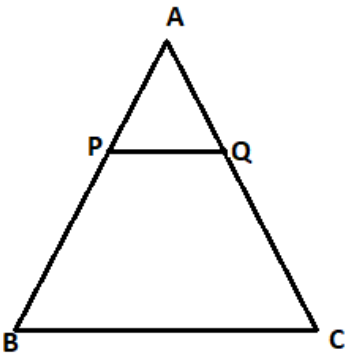
### Question 74

In  $\triangle ABC$ ,  $P$  and  $Q$  are the middle points of the sides  $AB$  and  $AC$  respectively.  $R$  is a point on the segment  $PQ$  such that  $PR : RQ = 1 : 2$ . If  $PR = 2$  cm, then  $BC =$

- A 4 cm
- B 2 cm
- C 12 cm
- D 6 cm

Answer: C

Explanation:



$$\frac{PR}{RQ} = \frac{1}{2} \text{ (given)}$$

$$PR = 2 \text{ cm}$$

$$\frac{2}{RQ} = \frac{1}{2}$$

$$\text{solving, } RQ = 4 \text{ cm}$$

$$PQ = PR + RQ = 2 + 4 = 6 \text{ cm}$$

As the line joining the mid points of 2 sides of a triangle is parallel and half of the third side

$$\text{therefore, } BC = 2PQ = 2 \times 6 = 12\text{cm}$$

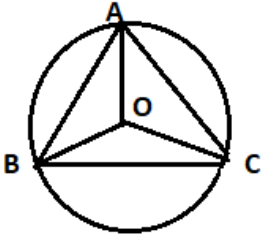
### Question 75

If  $O$  is the circumcenter of  $\triangle ABC$  and  $\angle OBC = 35^\circ$ , then the  $\angle BAC$  is equal to

- A  $55^\circ$
- B  $110^\circ$
- C  $70^\circ$
- D  $35^\circ$

Answer: A

Explanation:



$OB = OC =$  radius of the circle

$$\angle OBC = \angle OCB = 35^\circ$$

$$\angle BOC = 180 - 70 = 110^\circ$$

$$\angle BAC = \frac{110}{2} = 55^\circ \text{ [the angle subtended at the centre by an arc is twice to the angle subtended at the circumference]}$$

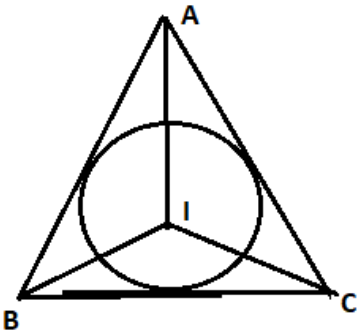
**Question 76**

If I is the in centre of ABC and  $\angle BIC = 135^\circ$ , then ABC is

- A acute angled
- B equilateral
- C right angled
- D obtuse angled

Answer: C

Explanation:



I is the incentre of a triangle

internal bisector of angle of a triangle meet at I

$$\angle BIC = 135^\circ \text{ (given) .....(1)}$$

$$\angle BIC = 90 + \frac{1}{2} \angle A \text{ .....(2) (property of internal bisector)}$$

from (1) and (2)

$$135^\circ = 90 + \frac{1}{2} \angle A$$

$$45^\circ = \frac{1}{2} \angle A$$

$$\angle A = 90^\circ$$

therefore triangle ABC is a right angled triangle

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**Question 77**

If  $\sin^2 \alpha + \sin^2 \beta$ , then the value of  $\cos \frac{\alpha+\beta}{2}$  is

- A 1
- B -1
- C 0
- D 0.5

Answer: C

**Question 78**

The value of  $\cot \frac{\pi}{20} \cot \frac{3\pi}{20} \cot \frac{5\pi}{20} \cot \frac{7\pi}{20} \cot \frac{9\pi}{20}$  is

- A -1
- B  $\frac{1}{2}$
- C 0
- D 1

Answer: D

**Question 79**

If  $\sin \theta + \cos \theta = \frac{17}{13}$ ,  $0 < \theta < 90^\circ$ , then the value of  $\sin \theta - \cos \theta$  is

- A  $\frac{5}{17}$
- B  $\frac{3}{19}$
- C  $\frac{7}{10}$
- D  $\frac{7}{13}$

Answer: D

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**Question 80**

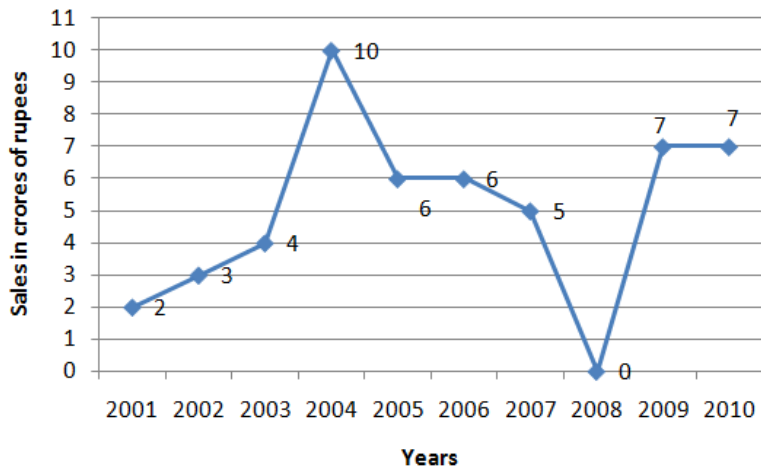
If  $\tan \theta \cdot \tan 2\theta = 1$ , then the value of  $\sin^2 2\theta + \tan^2 2\theta$  is equal to

- A  $\frac{3}{4}$
- B  $\frac{10}{3}$
- C  $\frac{3}{34}$
- D 3

Answer: C

**Instructions**

The following line diagram represents the yearly sales figure of a company in the years 2001 - 1010. Examine the diagram and answer the questions.



**Question 81**

By what percent did the sales in 2008 decrease in comparison to the sales in 2006?

- A 20
- B 18
- C  $16\frac{2}{3}$
- D  $15\frac{2}{3}$

Answer: C

**Question 82**

The ratio of sales in 2002 to that in 2007 is

- A 2 : 3
- B 1 : 3
- C 1 : 1
- D 3 : 5

Answer: D

**Explanation:**

ratio of sales in 2002 to that in 2007 = 3 : 5

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**Question 83**

Average sale (in crore of Rs.) of the company during the period 2003 - 2007 is

- A 5.8
- B 5
- C 6.2
- D 5.5

Answer: C

**Explanation:**

Average sale (in crore of Rs.) of the company during the period 2003 - 2007 =  $\frac{4+10+6+6+5}{5} = \frac{31}{5} = 6.2$

**Question 84**

The percentage decrease in sales in the year 2005 with respect to the previous year is

- A 80
- B 100
- C 40
- D 150

**Answer: C**

**Explanation:**

percentage decrease in sales in the year 2005 with respect to the previous year =  $\frac{10-4}{10} \times 100 = 40$

**Question 85**

Total sales (in crore of Rs.) from 2005 to 2008 is

- A 17
- B 27
- C 22
- D 31

**Answer: A**

**Explanation:**

Total sales (in crore of Rs.) from 2005 to 2008 = 6 + 6 + 5 + 0 = 17

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**Instructions**

The following table shows the number of students of 7 college participating in extra curricular activities:

Extra Circular Activities	College						
	A	B	C	D	E	F	G
I	200	300	500	100	400	300	200
II	100	200	200	100	100	100	100
III	65	130	420	75	540	220	153
IV	317	155	438	105	385	280	120

**Question 86**

The different of the range of number of students in activity IV and the average of number of students in activity III per college is

- A 111
- B 153
- C 104
- D 217

Answer: C

**Question 87**

Percentage of the number of students in activity II to that of IV is

- A 37
- B 42
- C 48
- D 50

Answer: D

**Explanation:**

number of students in activity II = 900

number of students in activity IV = 1800

Percentage of the number of students in activity II to that of IV =  $\frac{900}{1800} \times 100 = 50$

**Question 88**

The college in which minimum number of students participate in extra curricular activities is

- A D
- B A
- C B
- D C

Answer: A

**Explanation:**

number of students participate in college A = 682

number of students participate in college B = 785

number of students participate in college C = 1858

number of students participate in college D = 380

number of students participate in college E = 1425

number of students participate in college F = 900

number of students participate in college G = 573

therefore, college in which minimum number of students participate in extra curricular activities is D

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**Question 89**

The college in which minimum number of students participate in extra curricular activities is

- A D
- B G
- C F
- D A



Answer: A

**Explanation:**

number of students participate in college A = 682

number of students participate in college B = 785

number of students participate in college C = 1858

number of students participate in college D = 380

number of students participate in college E = 1425

number of students participate in college F = 900

number of students participate in college G = 573

therefore, college in which minimum number of students participate in extra curricular activities is D

**Question 90**

The ratio of total number of students in II and I is

A 1 : 2

B 9 : 20

C 19 : 7

D 21 : 10

Answer: B

**Explanation:**

total number of students in II = 900

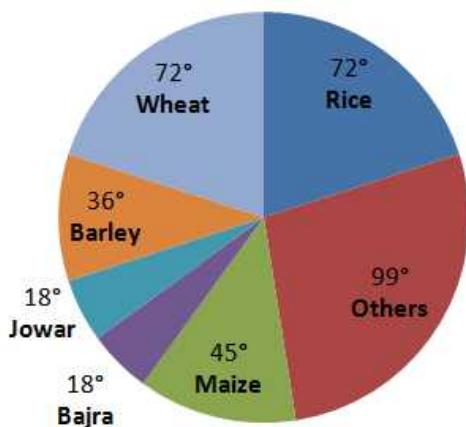
total number of students in I = 2000

ratio = 900 : 2000

= 9 : 20

**Instructions**

The pie-chart provided below gives the distribution of land (in a village) under various food crops. Study the pie-chart carefully and answer the questions.



**Question 91**

If the total area under bajra was three hundred acres, then the total area (in hundred acres) under rice and barley together is

A 18

B 12

- C 15  
D 20

Answer: A

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### Question 92

The combination of three crops which contribute to more than 50% of the total area under the food crops is

- A Wheat, rice and maize  
B wheat, rice and jowar  
C wheat, rice and bajra  
D rice, barley and maize

Answer: A

### Question 93

The ratio of the land used for rice and barley is

- A 3 : 1  
B 1 : 2  
C 2 : 1  
D 3 : 2

Answer: C

### Question 94

If 10% of the land reserved for rice be distributed to wheat and barley in the ratio 2 : 1, then the angle corresponding to wheat in the new pie-chart will be

- A  $38.4^\circ$   
B  $76.8^\circ$   
C  $75.6^\circ$   
D  $45.5^\circ$

Answer: B

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### Question 95

If the production of rice is 5 times that of jowar and the production of jowar is 2 times that of bazra, then the ratio between the yield per acre of rice and bazra is

- A 5 : 1

B 3 : 1

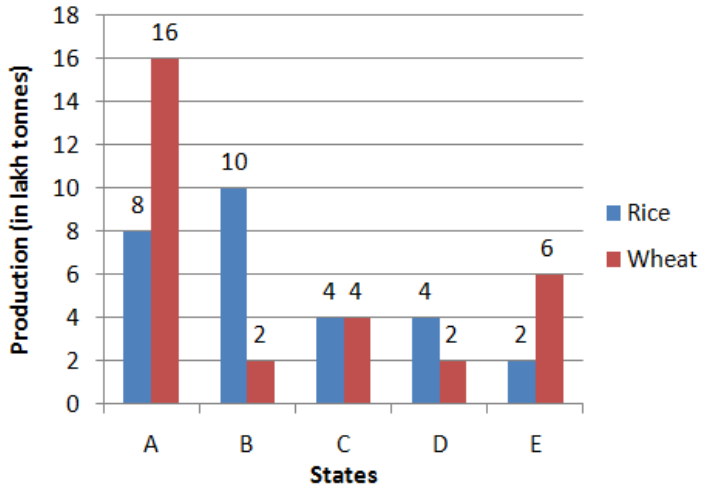
C 4 : 1

D 6 : 1

Answer: E

**Instructions**

The bar graph provided below represents the production of rice and wheat in different states of a country in the certain year. Answer the questions.



**Question 96**

The total production of rice and wheat in all the mentioned states in minimum in the state

A B

B C

C D

D E

Answer: C

**Explanation:**

total production of rice and wheat is minimum in state D

In state D total production = 6 lakh tonnes

**Question 97**

The ratio of total production of rice in the mentioned states to that of wheat in those states, is

A 15 : 16

B 12 : 13

C 13 : 14

D 14 : 15

Answer: D

**Explanation:**

total production of rice = 28

total production of wheat = 30

ratio of rice : wheat = 28 : 30

= 14 : 15

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### Question 98

The difference between the production in rice and wheat is maximum in

- A A only
- B All of A, B and E
- C B and E both
- D A and B both

**Answer:** D

#### **Explanation:**

difference between the production in rice and wheat for A = 8

B = 8

C = 0

D = 2

E = 4

Thus maximum for both and B

### Question 99

The state which is the largest producer of rice is

- A A
- B B
- C C
- D D

**Answer:** B

#### **Explanation:**

state B produced 10 lakh tonnes of rice thus state B is the largest producer of rice

### Question 100

The average of production of rice in the mentioned states (in lakh tonnes) is

- A 5 : 5
- B 5 : 6
- C 5 : 7
- D 5 : 8

**Answer:** B

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