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Mixed Quant for CGL Tier 1, SSC 10+2, CGL Tier 2 Exams.

SSC Maths Quiz 13

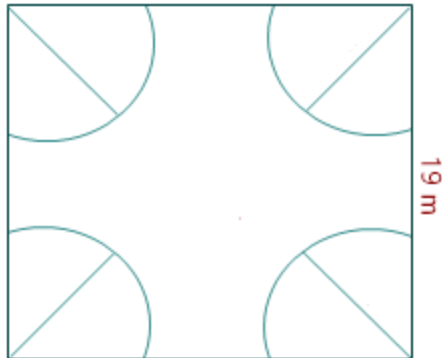
Directions: Read the following questions carefully and choose the right answer.

- From the top of the 25 m high building the angle of elevation to the top of a tower is equal to angle of depression to the bottom of the tower. Height of the building will be
A. 40 m B. 48 m C. 50 m D. 52 m
- If $x + y + z = 9$ and $xy + yz + zx = 23$, then the value of $(x^3 + y^3 + z^3 - 3xyz)$ is :
A. 108 B. 207 C. 669 D. 729
- A bag contains 20 tickets numbered from 1 to 20. Two tickets are drawn at random. What is the probability that both numbers are prime?
A. $\frac{8}{20}$ B. $\frac{14}{95}$ C. $\frac{7}{20}$ D. $\frac{21}{190}$
- An article is sold at 45/2% profit. If the cost price and selling price are increased by Rs. 40 and Rs. 35 respectively, then the profit on that article will be 15%. Find the cost of that article.
A. Rs. $146\frac{2}{3}$ B. Rs. $156\frac{2}{3}$ C. Rs. $146\frac{1}{3}$ D. Rs. $156\frac{1}{3}$
- Men, Women and children are employed to do a work in the proportion of 3 : 2 : 1 and their wages are in the proportion of 5 : 3 : 2. When 90 men are employed, total daily wages of all amounts to Rs. 10350. Find the daily wages of a man.
A. Rs. 45 B. Rs. 57.50 C. Rs. 115 D. Rs. 75
- If the CI on a certain sum for 2 years at 20% pa is Rs. 4400, and then the SI on it at the same rate for 2 years would be
A. 3900 B. 3600 C. 3800 D. 4000
- If $x = 3 + 2\sqrt{2}$, find the value of $(x^4 + \frac{1}{x^4})$.
A. 1024 B. 1154 C. 1734 D. None of these

8. A man can row at 5 kmph, in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?

- A. 2.5 km B. 3 km C. 2.4 km D. 3.6 km

9. A square park has each side 19 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 7 m, as the shown in the figure. Find the area of remaining part of the park.



- A. 93 sq m B. 207 sq m C. 211 sq m D. 112 sq m

10. 123 printers print 984 papers in $\frac{1}{15}$ hour. The average number of papers printed per minute by a printer is:

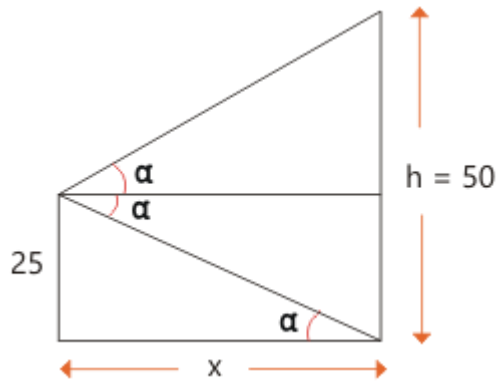
- A. 1 B. 2 C. 3 D. 5

Correct Answers:

1	2	3	4	5	6	7	8	9	10
C	A	B	A	D	D	B	C	B	B

Explanations :

1.



$$\frac{25}{x} = \tan \alpha \quad \dots(i)$$

$$\frac{h - 25}{x} = \tan \alpha \quad \dots(ii)$$

From eqn. (i) and (ii), we get

$$h = 50 \text{ m}$$

Hence, Option C is correct.

2. $(x^3 + y^3 + z^3 - 3xyz) = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$
 $= (x + y + z) [(x + y + z)^2 - 3(xy + yz + zx)]$
 $= 9 \times (81 - 3 \times 23) = (9 \times 12) = 108.$
Hence, Option A is correct.

3. Prime numbers between 1 and 20 are

2, 3, 5, 7, 11, 13, 17, 19

We have to select 2 prime numbers out of 8

$$\therefore \text{This can be done in } n(\mathbf{E}) = {}^8C_2 = \frac{8 \times 7}{2} = 28 \text{ ways}$$

Now the event of getting 2 prime numbers is n(S).

$$n(\mathbf{S}) = {}^{20}C_2 = \frac{20 \times 19}{2} = 190$$

$$\therefore \text{Reqd. probability } p(\mathbf{E}) = \frac{n(\mathbf{E})}{n(\mathbf{S})} = \frac{28}{190} = \frac{14}{95}$$

Hence, Option B is correct.

4. Let the CP of article be Rs. x

$$\text{It SP} = \frac{245x}{200} = \frac{49x}{40}$$

Again,

$$\text{New CP} = \text{Rs. } (x + 40)$$

$$\therefore (x + 40) \times \frac{115}{100} = \frac{49x}{40} + 35$$

$$(x + 40) \times \frac{23}{20} = \frac{49x}{40} + 35$$

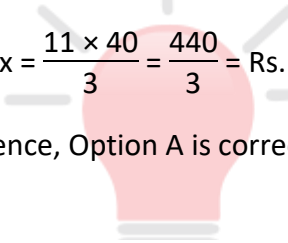
$$\frac{23x}{20} + 46 = \frac{49x}{40} + 35$$

$$\frac{49x}{40} - \frac{23x}{20} = 46 - 35$$

$$\frac{49x - 46x}{40} = 11 \Rightarrow \frac{3x}{40} = 11$$

$$\Rightarrow x = \frac{11 \times 40}{3} = \frac{440}{3} = \text{Rs. } 146\frac{2}{3}$$

Hence, Option A is correct.



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The Question Bank

5. Let the numbers of men, women and children are 3y, 2y and y and their wages are 5x, 3x and 2x respectively.

$$\text{Given, } 3y = 90 \Rightarrow y = 30$$

$$\text{Number of women} = 60 \text{ and No. of children} = 30$$

\therefore As per the question,

$$\text{Total daily wages} = \text{Rs. } 10350$$

$$\Rightarrow 90 \times 5x + 60 \times 3x + 30 \times 2x = 10350$$

$$\Rightarrow x(450 + 180 + 60) = 10350$$

$$\Rightarrow x = \frac{10350}{690} = 15$$

$$\therefore \text{Daily wages of a man} = 15 \times 5 = \text{Rs. } 75$$

Hence, Option D is correct.

6. By the net% effect formula, we can calculate the effective rate of CI for 2 years

$$\text{Net\% effect} = x + y + \frac{xy}{100}\%$$

Here, $x = y = 20\%$

$$\text{Effective rate \% of CI} = 20 + 20 + \frac{20 \times 20}{100} = 44\%$$

Let the principal amount be x , then

$$44\% \text{ of } x = 4400$$

$$x = 10,000$$

$$\text{SI for 2 years at } 20\% \text{ pa} = 20 \times 2 = 40\%$$

$$\text{Therefore, } 40\% \text{ of } 10000 = 4000/-$$

Hence, Option D is correct.

7. $x = 3 + 2\sqrt{2}$

$$\therefore \frac{1}{x} = \frac{1}{3 + 2\sqrt{2}}$$

(On rationalising the denominator)

$$\frac{3 - 2\sqrt{2}}{9 - 8} = 3 - 2\sqrt{2}$$

$$\therefore x + \frac{1}{x} = 3 + 2\sqrt{2} + 3 - 2\sqrt{2} = 6$$

$$\therefore \left(x + \frac{1}{x}\right)^2 = 6^2$$

$$x^2 + \frac{1}{x^2} = 36 - 2 = 34$$

On Squaring both sides, we get

$$\left(x^2 + \frac{1}{x^2}\right)^2 = 34^2$$

$$x^4 + \frac{1}{x^4} + 2 = 1156$$

$$x^4 + \frac{1}{x^4} = 1156 - 2 = 1154$$

Hence, Option B is correct.

8. Let the distance be x km.

Speed downstream = Speed of boat + Speed of current = $5 + 1 = 6$ kmph

Speed upstream = Speed of boat – Speed of current = $5 - 1 = 4$ kmph

Therefore, as per the question,

Time_{downstream} + Time_{upstream} = Total time

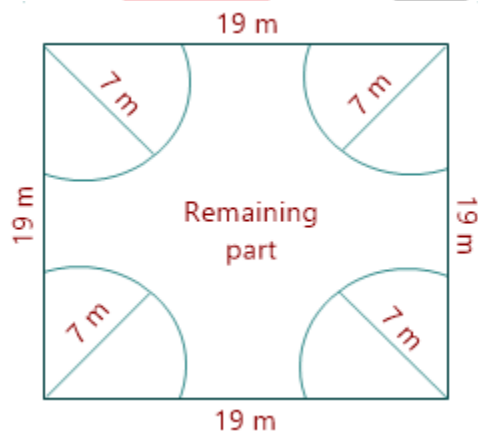
$$\therefore \frac{x}{6} + \frac{x}{4} = 1$$

$$\Rightarrow \frac{2x + 3x}{12} = 1 \Rightarrow 5x = 12$$

$$\Rightarrow x = 2.4 \text{ km}$$

Hence, Option C is correct.

9. As four quadrants make a circle,



\therefore Area of park without flower bed = Area of square – Area of circle

$$= \left[(19)^2 - \left(\frac{22}{7} \times 7 \times 7 \right) \right]$$

$$= [361 - 154] = 207 \text{ sq m}$$

\therefore Area of remaining part = 207 sq m

Hence, Option B is correct.

10. Using Unitary method, we get

In $\frac{1}{15}$ hour, 123 printers print 984 papers

In 1 minute, 123 printers print $\frac{984}{4} = 246$ papers

In 1 minute, 1 printer print $\frac{246}{123} = 2$ papers

Hence, Option B is correct.



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The Question Bank

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