Book For

National Insurance Company Limited

NICL AO Aptitude Sample Paper Pre Exam

(1) A batsman scored 110 runs which included 3 boundaries and 8 sixes. What percent of his total score did he make by running between the wickets?

[A] 45%

[B] $45\frac{5}{11}\%$

[C] $54\frac{6}{11}\%$

[D] 55%

Answer : [B]

Explanation:
Number of runs made by running = 110 - (3 x 4 + 8 x 6)
= 110 - (60)
= 50.
$\therefore$ Required percentage = $\left(\frac{50}{110} \times 100\right)\% = 45\frac{5}{11}\%$

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(2)
A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$.
What is the percentage error in the calculation?

[A] 34%

[B] 44%

[C] 54%

[D] 64%

Answer : [D]

Explanation:
Let the number be x.
Then, error = $\frac{5}{3}x - \frac{3}{5}x = \frac{16}{15}x$.

Error% = $\left(\frac{16x}{15} \times \frac{3}{5x} \times 100\right)\% = 64\%$.

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(3) Three candidates contested an election and received 1136, 7636 and 11628 votes respectively. What percentage of the total votes did the winning candidate get?

[A] 57%

[B] 60%

[C] 65%

[D] 90%

Answer : [A]

Explanation:
Total number of votes polled = (1136 + 7636 + 11628) = 20400.
$\therefore$ Required percentage = $\left(\frac{11628}{20400} \times 100\right)\% = 57\%$.

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(4) Two tailors X and Y are paid a total of Rs. 550 per week by their employer. If X is paid 120 percent of the sum paid to Y, how much is Y paid per week?

[A] Rs. 200

[B] Rs. 250

[C] Rs. 300

[D] None of these

Answer : [B]

Explanation:
Let the sum paid to Y per week be Rs. z.
Then, z + 120% of z = 550.
$\Rightarrow z + \frac{120}{100}z = 550$

$\Rightarrow \frac{11}{5}z = 550$

$\Rightarrow z = \left(\frac{550 \times 5}{11}\right) = 250$.

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(5) The ratio between the perimeter and the breadth of a rectangle is 5 : 1. If the area of the rectangle is 216 sq. cm, what is the length of the rectangle?

[A] 16 cm

[B] 18 cm

[C] 24 cm

[D] Data inadequate

[E] None of these

Answer : [B]

Explanation:
$\frac{2(l + b)}{b} = \frac{5}{1}$

$\Rightarrow 2l + 2b = 5b$
$\Rightarrow 3b = 2l$
$b = \frac{2}{3}l$

Then, Area = 216 cm^2
$\Rightarrow l \times b = 216$
$\Rightarrow l \times \frac{2}{3}l = 216$

$\Rightarrow l^2 = 324$
$\Rightarrow l = 18$ cm.

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(6) A rectangular park 60 m long and 40 m wide has two concrete crossroads running in the middle of the park and rest of the park has been used as a lawn. If the area of the lawn is 2109 sq. m, then what is the width of the road?

[A] 2.91 m

[B] 3 m

[C] 5.82 m

[D] None of these

Answer : [B]

Explanation:
Area of the park = (60 x 40) m^2 = 2400 m^2.
Area of the lawn = 2109 m^2.
$\therefore$ Area of the crossroads = (2400 - 2109) m^2 = 291 m^2.
Let the width of the road be x metres. Then,
$60x + 40x - x^2 = 291$
$\Rightarrow x^2 - 100x + 291 = 0$
$\Rightarrow (x - 97)(x - 3) = 0$
$\Rightarrow x = 3$.

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(7) The ratio between the length and the breadth of a rectangular park is 3 : 2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then the area of the park (in sq. m) is:

[A] 15360

[B] 153600

[C] 30720

[D] 307200

Answer : [B]

Explanation:
Perimeter = Distance covered in 8 min. = $\left(\frac{12000}{60} \times 8\right)$ m = 1600 m.

Let length = $3x$ metres and breadth = $2x$ metres.
Then, $2(3x + 2x) = 1600$ or $x = 160$.
$\therefore$ Length = 480 m and Breadth = 320 m.
$\therefore$ Area = (480 x 320) m^2 = 153600 m^2.

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(8) A towel, when bleached, was found to have lost 20% of its length and 10% of its breadth. The percentage of decrease in area is:

[A] 10%

[B] 10.08%

[C] 20%

[D] 28%

Answer : [D]

Explanation:
Let original length = x and original breadth = y.
Decrease in area = $xy - \left(\frac{80}{100}x \times \frac{90}{100}y\right)$

$= \left(xy - \frac{18}{25}xy\right)$

$= \frac{7}{25}xy.$

$\therefore$ Decrease % $= \left(\frac{7}{25}xy \times \frac{1}{xy} \times 100\right)_{\%} = 28\%.$

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(9) The diagonal of a rectangle is 41 cm and its area is 20 sq. cm. The perimeter of the rectangle must be:

[A] 9 cm

[B] 18 cm

[C] 20 cm

[D] 41 cm

Answer : [B]

Explanation:
$l^2 + b^2 = 41.$
Also, $lb = 20.$
$(l + b)^2 = (l^2 + b^2) + 2lb = 41 + 40 = 81$
$\Rightarrow (l + b) = 9.$
$\therefore$ Perimeter $= 2(l + b) = 18$ cm.

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(10) A rectangular field is to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq. feet, how many feet of fencing will be required?

[A] 34

[B] 40

[C] 68

[D] 88

Answer : [D]

Explanation:
We have: $l = 20$ ft and $lb = 680$ sq. ft.
So, $b = 34$ ft.
$\therefore$ Length of fencing $= (l + 2b) = (20 + 68)$ ft $= 88$ ft.

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(11) $(0.04)^{-1.5}$ = ?

[A] 25

[B] 125

[C] 250

[D] 625

Answer : [B]

Explanation:
$(0.04)^{-1.5} = \left(\frac{4}{100}\right)^{-1.5}$

$= \left(\frac{1}{25}\right)^{-(3/2)}$

$= (25)^{(3/2)}$
$= (5^2)^{(3/2)}$
$= (5)^{2 \times (3/2)}$
$= 5^3$
$= 125.$

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(12)

$$\left(\frac{x^b}{x^c}\right)^{(b + c - a)} \cdot \left(\frac{x^c}{x^a}\right)^{(c + a - b)} \cdot \left(\frac{x^a}{x^b}\right)^{(a + b - c)} = ?$$

[A] x^{abc}

[B] 1

[C] $x^{ab + bc + ca}$

[D] $x^{a + b + c}$

Answer : [B]

Explanation:

Given Exp. $= x^{(b - c)(b + c - a)} \cdot x^{(c - a)(c + a - b)} \cdot x^{(a - b)(a + b - c)}$

$= x^{(b - c)(b + c) - a(b - c)} \cdot x^{(c - a)(c + a) - b(c - a)} \cdot x^{(a - b)(a + b) - c(a - b)}$

$= x^{(b^2 - c^2 + c^2 - a^2 + a^2 - b^2)} \cdot x^{-a(b - c) - b(c - a) - c(a - b)}$

$= (x^0 \times x^0)$

$= (1 \times 1) = 1.$

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(13)

If $x = 3 + 2\ \ 2$, then the value of $\left(x - \frac{1}{x}\right)$ is:

[A] 1

[B] 2

[C] $2\ \ 2$

[D] $3\ \ 3$

Answer : [B]

Explanation:

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

$$= (3 + 2\ \ 2) + \frac{1}{(3 + 2\ \ 2)} - 2$$

$$= (3 + 2\ \ 2) + \frac{1}{(3 + 2\ \ 2)} \times \frac{(3 - 2\ \ 2)}{(3 - 2\ \ 2)} - 2$$

$= (3 + 2\ \ 2) + (3 - 2\ \ 2) - 2$
$= 4.$
$\therefore \left(x - \frac{1}{x}\right) = 2.$

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(14) A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

[A] 120 metres

[B] 180 metres

[C] 324 metres

[D] 150 metres

Answer : [D]

Explanation:

Speed= $\left(60 \times \frac{5}{18}\right)_{m/sec} = \left(\frac{50}{3}\right)_{m/sec}$.

Length of the train = (Speed x Time) = $\left(\frac{50}{3} \times 9\right)_{m} = 150$ m.

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(15) Two trains are moving in opposite directions @ 60 km/hr and 90 km/hr. Their lengths are 1.10 km and 0.9 km respectively. The time taken by the slower train to cross the faster train in seconds is:

[A] 36

[B] 45

[C] 48

[D] 49

Answer : [C]

Explanation:

Relative speed = (60+ 90) km/hr

$= \left(150 \times \frac{5}{18}\right)_{m/sec}$

$= \left(\frac{125}{3}\right)_{m/sec}$.

Distance covered = (1.10 + 0.9) km = 2 km = 2000 m.

Required time = $\left(2000 \times \frac{3}{125}\right)_{sec} = 48$ sec.

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(16) A train 360 m long is running at a speed of 45 km/hr. In what time will it pass a bridge 140 m long?

[A] 40 sec

[B] 42 sec

[C] 45 sec

[D] 48 sec

Answer : [A]

Explanation:

Formula for converting from km/hr to m/s: X km/hr = $\left(X \times \frac{5}{18}\right)_{m/s}$.

Therefore, Speed = $\left(45 \times \frac{5}{18}\right)_{m/sec} = \frac{25}{2}$ m/sec.

Total distance to be covered = (360 + 140) m = 500 m.

Formula for finding Time = $\left(\frac{\text{Distance}}{\text{Speed}}\right)$

$\therefore$ Required time = $\left(\frac{500 \times 2}{25}\right)_{\text{sec}}$ = 40 sec.

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(17) A jogger running at 9 kmph alongside a railway track in 240 metres ahead of the engine of a 120 metres long train running at 45 kmph in the same direction. In how much time will the train pass the jogger?

[A] 3.6 sec

[B] 18 sec

[C] 36 sec

[D] 72 sec

Answer : [C]

Explanation:
Speed of train relative to jogger = (45 - 9) km/hr = 36 km/hr.

$= \left(36 \times \frac{5}{18}\right)_{\text{m/sec}}$

= 10 m/sec.
Distance to be covered = (240 + 120) m = 360 m.

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(18) A train 110 metres long is running with a speed of 60 kmph. In what time will it pass a man who is running at 6 kmph in the direction opposite to that in which the train is going?

[A] 5 sec

[B] 6 sec

[C] 7 sec

[D] 10 sec

Answer : [B]

Explanation:
Speed of train relative to man = (60 + 6) km/hr = 66 km/hr.

$= \left(66 \times \frac{5}{18}\right)_{\text{m/sec}}$

$= \left(\frac{55}{3}\right)_{\text{m/sec.}}$

$\therefore$ Time taken to pass the man = $\left(110 \times \frac{3}{55}\right)_{\text{sec}}$ = 6 sec.

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(19) Two trains are running in opposite directions with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds, then the speed of each train (in km/hr) is:

[A] 10

[B] 18

[C] 36

[D] 72

Answer : [C]

Explanation:
Let the speed of each train be x m/sec.
Then, relative speed of the two trains = $2x$ m/sec.
So, $2x = \frac{(120 + 120)}{12}$

$\Rightarrow 2x = 20$
$\Rightarrow x = 10.$
$\therefore$ Speed of each train = 10 m/sec = $\left(10 \times \frac{18}{5}\right)$ km/hr = 36 km/hr.

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(20) A train overtakes two persons who are walking in the same direction in which the train is going, at the rate of 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. The length of the train is:

[A] 45 m

[B] 50 m

[C] 54 m

[D] 72 m

Answer : [B]

Explanation:
2 kmph = $\left(2 \times \frac{5}{18}\right)$ m/sec = $\frac{5}{9}$ m/sec.

4 kmph = $\left(4 \times \frac{5}{18}\right)$ m/sec = $\frac{10}{9}$ m/sec.

Let the length of the train be x metres and its speed by y m/sec.
Then, $\left(\frac{x}{y - \frac{5}{9}}\right) = 9$ and $\left(\frac{x}{y - \frac{10}{9}}\right) = 10.$

$\therefore 9y - 5 = x$ and $10(9y - 10) = 9x$
$\Rightarrow 9y - x = 5$ and $90y - 9x = 100.$
On solving, we get: $x = 50.$
$\therefore$ Length of the train is 50 m.
