Book For

Maharashtra Public Service Commission

MPSC Assistant Commissioner Aptitude Sample Paper

(1) If A = x% of y and B = y% of x, then which of the following is true?

[A] A is smaller than B.

[B] A is greater than B

[C] Relationship between A and B cannot be determined.

[D] If x is smaller than y, then A is greater than B.

[E] None of these

Answer : [E]

Explanation:

$x\%$ of $y = \left(\frac{x}{100} \times y\right) = \left(\frac{y}{100} \times x\right) = y\%$ of x

$\therefore$ A = B.

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(2) A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

[A] 588 apples

[B] 600 apples

[C] 672 apples

[D] 700 apples

Answer : [D]

Explanation:

Suppose originally he had x apples.

Then, (100 - 40)% of x = 420.

$\Rightarrow \frac{60}{100} \times x = 420$

$\Rightarrow x = \left(\frac{420 \times 100}{60}\right) = 700.$

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(3) If 20% of a = b, then b% of 20 is the same as:

[A] 4% of a

[B] 5% of a

[C] 20% of a

[D] None of these

Answer : [A]

Explanation:

20% of $a = b \Rightarrow \frac{20}{100}a = b.$

$\therefore$ $b\%$ of $20 = \left(\frac{b}{100} \times 20\right) = \left(\frac{20}{100}a \times \frac{1}{100} \times 20\right) = \frac{4}{100}a = 4\%$ of a.

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(4) Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B. Find the ratio of A : B.

[A] 2 : 3

[B] 1 : 1

[C] 3 : 4

[D] 4 : 3

Answer : [D]

Explanation:

$5\%\text{ of A} + 4\%\text{ of B} = \frac{2}{3}(6\%\text{ of A} + 8\%\text{ of B})$

$\Rightarrow \frac{5}{100}A + \frac{4}{100}B = \frac{2}{3}\left(\frac{6}{100}A + \frac{8}{100}B\right)$

$\Rightarrow \frac{1}{20}A + \frac{1}{25}B = \frac{1}{25}A + \frac{4}{75}B$

$\Rightarrow \left(\frac{1}{20} - \frac{1}{25}\right)A = \left(\frac{4}{75} - \frac{1}{25}\right)B$

$\Rightarrow \frac{1}{100}A = \frac{1}{75}B$

$\frac{A}{B} = \frac{100}{75} = \frac{4}{3}$.

$\therefore$ Required ratio = 4 : 3

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(5)

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 = $\frac{5}{3}x - \frac{3}{5}x = \frac{16}{15}x$.

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

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(6) The reflex angle between the hands of a clock at 10.25 is:

[A] 180?

[B]

$192\frac{1}{2}$?

[C] 195?

[D]
$197\ \frac{1}{2}^{?}$

Answer : [D]

Explanation:

Angle traced by hour hand in $\frac{125}{12}$ hrs = $\left(\frac{360}{12} \times \frac{125}{12}\right)^{?} = 312\frac{1}{2}^{?}$.

Angle traced by minute hand in 25 min = $\left(\frac{360}{60} \times 25\right)^{?} = 150?$.

$\therefore$ Reflex angle = $360? - \left(312\frac{1}{2} - 150\right)^{?} = 360? - 162\frac{1}{2}^{?} = 197\frac{1}{2}$.

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(7) At what angle the hands of a clock are inclined at 15 minutes past 5?

[A]
$58\ \frac{1}{2}^{?}$

[B] 64?

[C]
$67\ \frac{1}{2}^{?}$

[D]
$72\ \frac{1}{2}^{?}$

Answer : [C]

Explanation:

Angle traced by hour hand in $\frac{21}{4}$ hrs = $\left(\frac{360}{12} \times \frac{21}{4}\right)^{?} = 157\frac{1}{2}^{?}$

Angle traced by min. hand in 15 min. = $\left(\frac{360}{60} \times 15\right)^{?} = 90?$.

$\therefore$ Required angle = $\left(157\frac{1}{2}\right)^{?} - 90? = 67\frac{1}{2}^{?}$

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(8) The angle between the minute hand and the hour hand of a clock when the time is 4.20, is:

[A] 0?

[B] 10?

[C] 5?

[D] 20?

Answer : [B]

Explanation:

Angle traced by hour hand in $\frac{13}{3}$ hrs = $\left(\frac{360}{12} \times \frac{13}{3}\right)^{?} = 130?$.

Angle traced by min. hand in 20 min. = $\left(\frac{360}{60} \times 20\right)^? = 120?$.

∴ Required angle = (130 - 120)? = 10?.

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(9) How many times are the hands of a clock at right angle in a day?

[A] 22

[B] 24

[C] 44

[D] 48

Answer : [C]

Explanation:
In 12 hours, they are at right angles 22 times.
∴ In 24 hours, they are at right angles 44 times.

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(10) How many times in a day, the hands of a clock are straight?

[A] 22

[B] 24

[C] 44

[D] 48

Answer : [C]

Explanation:
In 12 hours, the hands coincide or are in opposite direction 22 times.
∴ In 24 hours, the hands coincide or are in opposite direction 44 times a day.

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(11) If $a - b = 3$ and $a^2 + b^2 = 29$, find the value of ab.

[A] 10

[B] 12

[C] 15

[D] 18

Answer : [A]

Explanation:
$2ab = (a^2 + b^2) - (a - b)^2$
$= 29 - 9 = 20$
$\Rightarrow ab = 10$.

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(12) The price of 2 sarees and 4 shirts is Rs. 1600. With the same money one can buy 1 saree and 6 shirts. If one wants to buy 12 shirts, how much shall he have to pay ?

[A] Rs. 1200

[B] Rs. 2400

[C] Rs. 4800

[D] Cannot be determined

[E] None of these

Answer : [B]

Explanation:
Let the price of a saree and a shirt be Rs. x and Rs. y respectively.
Then, $2x + 4y = 1600$ .... (i)
and $x + 6y = 1600$ .... (ii)
Solving (i) and (ii) we get $x = 400$, $y = 200$.
$\therefore$ Cost of 12 shirts = Rs. (12 x 200) = Rs. 2400.

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(13) A sum of Rs. 1360 has been divided among A, B and C such that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ of what C gets. B's share is:

[A] Rs. 120

[B] Rs. 160

[C] Rs. 240

[D] Rs. 300

Answer : [C]

Explanation:
Let C's share = Rs. x

Then, B's share = Rs. $\frac{x}{4}$, A's share = Rs. $\left(\frac{2}{3} \times \frac{x}{4}\right)$ = Rs. $\frac{x}{6}$

$\therefore \frac{x}{6} + \frac{x}{4} + x = 1360$

$\Rightarrow \frac{17x}{12} = 1360$

$\Rightarrow x = \frac{1360 \times 12}{17}$ = Rs. 960

Hence, B's share = Rs. $\left(\frac{960}{4}\right)$ = Rs. 240.

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(14)

$\frac{(469 + 174)^2 - (469 - 174)^2}{(469 \times 174)} = ?$

[A] 2

[B] 4

[C] 295

[D] 643

Answer : [B]

Explanation:

Given exp. $= \frac{(a + b)^2 - (a - b)^2}{ab}$

$= \frac{4ab}{ab}$

$= 4$ (where $a = 469$, $b = 174$.)

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(15) A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140, then the number of hens will be:

[A] 22

[B] 23

[C] 24

[D] 26

Answer : [D]

Explanation:
Let the number of hens be x and the number of cows be y.
Then, $x + y = 48$ .... (i)
and $2x + 4y = 140 \Rightarrow x + 2y = 70$ .... (ii)
Solving (i) and (ii) we get: $x = 26$, $y = 22$.
$\therefore$ The required answer = 26.

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(16) Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:

[A] 9

[B] 11

[C] 13

[D] 15

Answer : [D]

Explanation:
Let the three integers be x, $x + 2$ and $x + 4$.
Then, $3x = 2(x + 4) + 3 \Leftrightarrow x = 11$.
$\therefore$ Third integer = $x + 4 = 15$.

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(17) If one-third of one-fourth of a number is 15, then three-tenth of that number is:

[A] 35

[B] 36

[C] 45

[D] 54

Answer : [D]

Explanation:
Let the number be x.
Then, $\frac{1}{3}$ of $\frac{1}{4}$ of $x = 15 \Leftrightarrow x = 15 \times 12 = 180$.

So, required number = $\left(\frac{3}{10} \times 180\right)$ = 54.

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(18) In a two-digit, if it is known that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and the sum of its digits is equal to 144, then the number is:

[A] 24

[B] 26

[C] 42

[D] 46

Answer : [A]

Explanation:
Let the ten's digit be x.
Then, unit's digit = $x + 2$.
Number = $10x + (x + 2) = 11x + 2$.
Sum of digits = $x + (x + 2) = 2x + 2$.
$\therefore$ $(11x + 2)(2x + 2) = 144$
$\Rightarrow 22x^2 + 26x - 140 = 0$
$\Rightarrow 11x^2 + 13x - 70 = 0$
$\Rightarrow (x - 2)(11x + 35) = 0$
$\Rightarrow x = 2$.
Hence, required number = $11x + 2 = 24$.

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(19) The product of two numbers is 9375 and the quotient, when the larger one is divided by the smaller, is 15. The sum of the numbers is:

[A] 380

[B] 395

[C] 400

[D] 425

Answer : [C]

Explanation:
Let the numbers be x and y.
Then, $xy = 9375$ and $\frac{x}{y} = 15$.

$$\frac{xy}{(x/y)} = \frac{9375}{15}$$

$\Rightarrow y^2 = 625$.
$\Rightarrow y = 25$.
$\Rightarrow x = 15y = (15 \times 25) = 375$.
$\therefore$ Sum of the numbers = $x + y = 375 + 25 = 400$.

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(20) The product of two numbers is 120 and the sum of their squares is 289. The sum of the number is:

[A] 20

[B] 23

[C] 169

[D] None of these

Answer : [B]

Explanation:
Let the numbers be x and y.
Then, $xy = 120$ and $x^2 + y^2 = 289$.
$\therefore (x + y)^2 = x^2 + y^2 + 2xy = 289 + (2 \times 120) = 529$
$\therefore x + y = \sqrt{529} = 23$.
