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CCRH Math Aptitude Sample Paper 2016 PDF Download

(1) The banker's gain on a sum due 3 years hence at 12% per annum is Rs. 270. The banker's discount is:

[A] Rs. 960

[B] Rs. 840

[C] Rs. 1020

[D] Rs. 760

Answer : [C]

Explanation:

$$\text{T.D.} = \left(\frac{\text{B.G.} \times 100}{\text{R} \times \text{T}}\right) = \text{Rs.} \left(\frac{270 \times 100}{12 \times 3}\right) = \text{Rs. } 750.$$

$\therefore$ B.D. = Rs.(750 + 270) = Rs. 1020.

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(2) The banker's discount of a certain sum of money is Rs. 72 and the true discount on the same sum for the same time is Rs. 60. The sum due is:

[A] Rs. 360

[B] Rs. 432

[C] Rs. 540

[D] Rs. 1080

Answer : [A]

Explanation:

$$\text{Sum} = \frac{\text{B.D.} \times \text{T.D.}}{\text{B.D.} - \text{T.D.}} = \text{Rs.} \left(\frac{72 \times 60}{72 - 60}\right) = \text{Rs.} \left(\frac{72 \times 60}{12}\right) = \text{Rs. } 360.$$

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(3) The banker's gain on a bill due 1 year hence at 12% per annum is Rs. 6. The true discount is:

[A] Rs. 72

[B] Rs. 36

[C] Rs. 54

[D] Rs. 50

Answer : [D]

Explanation:

$$\text{T.D.} = \frac{\text{B.G.} \times 100}{\text{R} \times \text{T}} = \text{Rs.} \left(\frac{6 \times 100}{12 \times 1}\right) = \text{Rs. } 50.$$

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(4) The certain worth of a certain sum due sometime hence is Rs. 1600 and the true discount is Rs. 160. The banker's gain is:

[A] Rs. 20

[B] Rs. 24

[C] Rs. 16

[D] Rs. 12

Answer : [C]

Explanation:

$$\text{B.G.} = \frac{(\text{T.D.})^2}{\text{P.W.}} = \text{Rs.} \left(\frac{160 \times 160}{1600}\right) = \text{Rs. } 16.$$

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(5) The true discount on a bill of Rs. 540 is Rs. 90. The banker's discount is:

[A] Rs. 60

[B] Rs. 108

[C] Rs. 110

[D] Rs. 112

Answer : [B]

Explanation:
P.W. = Rs. (540 - 90) = Rs. 450.
∴ S.I. on Rs. 450 = Rs. 90.
S.I. on Rs. 540 = Rs. $\left(\frac{90}{450} \times 540\right)$ = Rs. 108.

∴ B.D. = Rs. 108.

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(6) The least perfect square, which is divisible by each of 21, 36 and 66 is:

[A] 213444

[B] 214344

[C] 214434

[D] 231444

Answer : [A]

Explanation:
L.C.M. of 21, 36, 66 = 2772.
Now, 2772 = 2 x 2 x 3 x 3 x 7 x 11
To make it a perfect square, it must be multiplied by 7 x 11.
So, required number = $2^2 \times 3^2 \times 7^2 \times 11^2 = 213444$

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(7)
If $x = \frac{3 + 1}{3 - 1}$ and $y = \frac{3 - 1}{3 + 1}$, then the value of $(x^2 + y^2)$ is:

[A] 10

[B] 13

[C] 14

[D] 15

Answer : [C]

Explanation:
$x = \frac{(3 + 1)}{(3 - 1)} \times \frac{(3 + 1)}{(3 + 1)} = \frac{(3 + 1)^2}{(3 - 1)} = \frac{3 + 1 + 2\sqrt{3}}{2} = 2 + \sqrt{3}.$

$y = \frac{(3 - 1)}{(3 + 1)} \times \frac{(3 - 1)}{(3 - 1)} = \frac{(3 - 1)^2}{(3 - 1)} = \frac{3 + 1 - 2\sqrt{3}}{2} = 2 - \sqrt{3}.$

∴ $x^2 + y^2 = (2 + \sqrt{3})^2 + (2 - \sqrt{3})^2$
$= 2(4 + 3)$
$= 14$

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(8)
If $\sqrt{5} = 2.236$, then the value of $\frac{\sqrt{5}}{2} - \frac{10}{\sqrt{5}} + \sqrt{125}$ is equal to:

[A] 5.59

[B] 7.826

[C] 8.944

[D] 10.062

Answer : [B]

Explanation:

$\frac{5}{2} - \frac{10}{5} + \sqrt{125} = \frac{(\sqrt{5})^2 - 20 + 2\sqrt{5} \times 5\sqrt{5}}{2\sqrt{5}}$

$= \frac{5 - 20 + 50}{2\sqrt{5}}$

$= \frac{35}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$

$= \frac{35\sqrt{5}}{10}$

$= \frac{7 \times 2.236}{2}$

$= 7 \times 1.118$

$= 7.826$

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(9)

$\left(\frac{625}{11} \times \frac{14}{25} \times \frac{11}{196}\right)$ is equal to:

[A] 5

[B] 6

[C] 8

[D] 11

Answer : [A]

Explanation:

Given Expression $= \frac{25}{11} \times \frac{14}{5} \times \frac{11}{14} = 5.$

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(10) How many two-digit numbers satisfy this property.: The last digit (unit's digit) of the square of the two-digit number is 8 ?

[A] 1

[B] 2

[C] 3

[D] None of these

Answer : [D]

Explanation: A number ending in 8 can never be a perfect square.

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(11) There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs. 12,000 after 3 years at the same rate?

[A] Rs. 2160

[B] Rs. 3120

[C] Rs. 3972

[D] Rs. 6240

[E] None of these

Answer : [C]

Explanation:
Let P = Rs. 100. Then, S.I. Rs. 60 and T = 6 years.
$\therefore$ R = $\left(\frac{100 \times 60}{100 \times 6}\right)$ = 10% p.a.

Now, P = Rs. 12000. T = 3 years and R = 10% p.a.
$\therefore$ C.I. = Rs. $\left[12000 \times \left\{\left(1 + \frac{10}{100}\right)^3 - 1\right\}\right]$

= Rs. $\left(12000 \times \frac{331}{1000}\right)$

= 3972.

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(12) The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is:

[A] 2

[B] $2\frac{1}{2}$

[C] 3

[D] 4

Answer : [A]

Explanation:
Amount = Rs. (30000 + 4347) = Rs. 34347.
Let the time be n years.
Then, $30000\left(1 + \frac{7}{100}\right)^n = 34347$

$\Rightarrow \left(\frac{107}{100}\right)^n = \frac{34347}{30000} = \frac{11449}{10000} = \left(\frac{107}{100}\right)^2$

$\therefore$ n = 2 years.

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(13) Albert invested an amount of Rs. 8000 in a fixed deposit scheme for 2 years at compound interest rate 5 p.c.p.a. How much amount will Albert get on maturity of the fixed deposit?

[A] Rs. 8600

[B] Rs. 8620

[C] Rs. 8820

[D] None of these

Answer : [C]

Explanation:
Amount = Rs. $\left[8000 \times \left(1 + \frac{5}{100}\right)^2\right]$

= Rs. $\left(8000 \times \frac{21}{20} \times \frac{21}{20}\right)$

= Rs. 8820.

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(14) What will be the compound interest on a sum of Rs. 25,000 after 3 years at the rate of 12 p.c.p.a.?

[A] Rs. 9000.30

[B] Rs. 9720

[C] Rs. 10123.20

[D] Rs. 10483.20

[E] None of these

Answer : [C]

Explanation:

$$\text{Amount} = \text{Rs.}\left[25000 \times \left(1 + \frac{12}{100}\right)^3\right]$$

$$= \text{Rs.}\left(25000 \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25}\right)$$

$$= \text{Rs. } 35123.20$$

$\therefore$ C.I. = Rs. (35123.20 - 25000) = Rs. 10123.20

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(15) The difference between simple interest and compound on Rs. 1200 for one year at 10% per annum reckoned half-yearly is:

[A] Rs. 2.50

[B] Rs. 3

[C] Rs. 3.75

[D] Rs. 4

[E] None of these

Answer : [B]

Explanation:

$$\text{S.I.} = \text{Rs}\left(\frac{1200 \times 10 \times 1}{100}\right) = \text{Rs. } 120.$$

$$\text{C.I.} = \text{Rs.}\left[1200 \times \left(1 + \frac{5}{100}\right)^2 - 1200\right] = \text{Rs. } 123.$$

$\therefore$ Difference = Rs. (123 - 120) = Rs. 3.

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(16) The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?

[A] 3

[B] 4

[C] 9

[D] Cannot be determined

[E] None of these

Answer : [B]

Explanation:

Let the ten's digit be x and unit's digit be y.
Then, $(10x + y) - (10y + x) = 36$
$\Rightarrow 9(x - y) = 36$
$\Rightarrow x - y = 4$.

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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 sum of the digits of a two-digit number is 15 and the difference between the digits is 3. What is the two-digit number?

[A] 69

[B] 78

[C] 96

[D] Cannot be determined

[E] None of these

Answer : [D]

Explanation:
Let the ten's digit be x and unit's digit be y.
Then, $x + y = 15$ and $x - y = 3$ or $y - x = 3$.
Solving $x + y = 15$ and $x - y = 3$, we get: $x = 9$, $y = 6$.
Solving $x + y = 15$ and $y - x = 3$, we get: $x = 6$, $y = 9$.
So, the number is either 96 or 69.
Hence, the number cannot be determined.

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(20) A number consists of 3 digits whose sum is 10. The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is:

[A] 145

[B] 253

[C] 370

[D] 352

Answer : [B]

Explanation:
Let the middle digit be x.
Then, $2x = 10$ or $x = 5$. So, the number is either 253 or 352.
Since the number increases on reversing the digits, so the hundred's digits is smaller than the unit's digit.
Hence, required number = 253.
