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Punjab Police

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(1) Rs. 9800 are invested partly in 9% stock at 75 and 10% stock at 80 to have equal amount of incomes. The investment in 9% stock is:

[A] Rs. 4800

[B] Rs. 5000

[C] Rs. 5400

[D] Rs. 5600

Answer : [B]

Explanation:
Let the investment in 9% stock be Rs. x.
Then, investment in 10% stock = Rs. (9800 - x).
$\frac{9}{75} \times x = \frac{10}{80} \times (9800 - x)$

$\Rightarrow \frac{3x}{25} = \frac{9800 - x}{8}$

$\Rightarrow 24x = 9800 \times 25 - 25x$
$\Rightarrow 49x = 9800 \times 25$
$\Rightarrow x = 5000.$

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(2) Sakshi invests a part of Rs. 12,000 in 12% stock at Rs. 120 and the remainder in 15% stock at Rs. 125. If his total dividend per annum is Rs. 1360, how much does he invest in 12% stock at Rs. 120?

[A] Rs. 4000

[B] Rs. 4500

[C] Rs. 5500

[D] Rs. 6000

Answer : [A]

Explanation:
Let investment in 12% stock be Rs. x.
Then, investment in 15% stock = Rs. (12000 - x).
$\therefore \frac{12}{120} \times x + \frac{15}{125} \times (12000 - x) = 1360.$

$\Rightarrow \frac{x}{10} + \frac{3}{25}(12000 - x) = 1360.$

$\Rightarrow 5x + 72000 - 6x = 1360 \times 50$
$\Rightarrow x = 4000.$

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(3)

The cost price of a Rs. 100 stock at 4 discount, when brokerage is $\frac{1}{4}\%$ is:

[A] Rs. 95.75

[B] Rs. 96

[C] Rs. 96.25

[D] Rs. 104.25

Answer : [C]

Explanation:
C.P. = Rs. $\left(100 - 4 + \frac{1}{4}\right)$ = Rs. 96.25

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(4) A man invested Rs. 1552 in a stock at 97 to obtain an income of Rs. 128. The dividend from the stock is:

[A] 7.5%

[B] 8%

[C] 9.7%

[D] None of these

Answer : [B]

Explanation:
By investing Rs. 1552, income = Rs. 128.
By investing Rs. 97, income = Rs. $\left(\frac{128}{1552} \times 97\right)$ = Rs. 8.

$\therefore$ Dividend = 8%

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(5) The market value of a 10.5% stock, in which an income of Rs. 756 is derived by investing Rs. 9000, brokerage being $\frac{1}{4}$%, is:

[A] Rs. 108.25

[B] Rs. 112.20

[C] Rs. 124.75

[D] Rs. 125.25

Answer : [C]

Explanation:
For an income of Rs. 756, investment = Rs. 9000.
For an income of Rs. $\frac{21}{2}$, investment = Rs. $\left(\frac{9000}{756} \times \frac{21}{2}\right)$ = Rs. 125.

$\therefore$ For a Rs. 100 stock, investment = Rs. 125.
Market value of Rs. 100 stock = Rs. $\left(125 - \frac{1}{4}\right)$ = Rs. 124.75

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(6) The effective annual rate of interest corresponding to a nominal rate of 6% per annum payable half-yearly is:

[A] 6.06%

[B] 6.07%

[C] 6.08%

[D] 6.09%

Answer : [D]

Explanation:
Amount of Rs. 100 for 1 year when compounded half-yearly = Rs. $\left[100 \times \left(1 + \frac{3}{100}\right)^2\right]$ = Rs. 106.09

$\therefore$ Effective rate = (106.09 - 100)% = 6.09%

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(7) The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is:

[A] 3

[B] 4

[C] 5

[D] 6

Answer : [B]

Explanation:
$P\left(1 + \frac{20}{100}\right)^n > 2P \quad \Rightarrow \quad \left(\frac{6}{5}\right)^n > 2.$

Now, $\left(\frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5}\right) > 2$.

So, $n = 4$ years.

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(8) 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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(9) At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

[A] 6%

[B] 6.5%

[C] 7%

[D] 7.5%

Answer : [A]

Explanation:

Let the rate be R% p.a.

Then, $1200 \times \left(1 + \frac{R}{100}\right)^2 = 1348.32$

$\Rightarrow \left(1 + \frac{R}{100}\right)^2 = \frac{134832}{120000} = \frac{11236}{10000}$

$\therefore \left(1 + \frac{R}{100}\right)^2 = \left(\frac{106}{100}\right)^2$

$\Rightarrow 1 + \frac{R}{100} = \frac{106}{100}$

$\Rightarrow R = 6\%$

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(10) 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.

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(11) 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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(12) 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 $x^2 + y^2 = 289$.
$\therefore (x + y)^2 = x^2 + y^2 + 2xy = 289 + (2 \times 120) = 529$
$\therefore x + y = \sqrt{529} = 23$.

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(13) The sum of two number is 25 and their difference is 13. Find their product.

[A] 104

[B] 114

[C] 315

[D] 325

Answer : [B]

Explanation:
Let the numbers be x and y.
Then, $x + y = 25$ and $x - y = 13$.
$4xy = (x + y)^2 - (x - y)^2$
$= (25)^2 - (13)^2$
$= (625 - 169)$
$= 456$
$\therefore xy = 114$.

(14) What is the sum of two consecutive even numbers, the difference of whose squares is 84?

[A] 34

[B] 38

[C] 42

[D] 46

Answer : [C]

Explanation:
Let the numbers be x and $x + 2$.
Then, $(x + 2)^2 - x^2 = 84$
$\Rightarrow 4x + 4 = 84$
$\Rightarrow 4x = 80$
$\Rightarrow x = 20$.
$\therefore$ The required sum = $x + (x + 2) = 2x + 2 = 42$.

(15) Today is Monday. After 61 days, it will be:

[A] Wednesday

[B] Saturday

[C] Tuesday

[D] Thursday

Answer : [B]

Explanation:
Each day of the week is repeated after 7 days.
So, after 63 days, it will be Monday.
$\therefore$ After 61 days, it will be Saturday.

(16) How many days are there in *x* weeks *x* days?

[A] $7x^2$

[B] $8x$

[C] $14x$

[D] 7

Answer : [B]

Explanation:
x weeks x days = $(7x + x)$ days = $8x$ days.

(17) The last day of a century cannot be

[A] Monday

[B] Wednesday

[C] Tuesday

[D] Friday

Answer : [C]

Explanation:
100 years contain 5 odd days.
$\therefore$ Last day of 1^{st} century is Friday.
200 years contain (5 x 2) $\equiv$ 3 odd days.

∴ Last day of 2nd century is Wednesday.
300 years contain (5 x 3) = 15 ≡ 1 odd day.
∴ Last day of 3rd century is Monday.
400 years contain 0 odd day.
∴ Last day of 4th century is Sunday.
This cycle is repeated.
∴ Last day of a century cannot be Tuesday or Thursday or Saturday.

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(18) If 6th March, 2005 is Monday, what was the day of the week on 6th March, 2004?

[A] Sunday

[B] Saturday

[C] Tuesday

[D] Wednesday

Answer : [A]

Explanation:
The year 2004 is a leap year. So, it has 2 odd days.
But, Feb 2004 not included because we are calculating from March 2004 to March 2005. So it has 1 odd day only.
∴ The day on 6th March, 2005 will be 1 day beyond the day on 6th March, 2004.
Given that, 6th March, 2005 is Monday.
∴ 6th March, 2004 is Sunday (1 day before to 6th March, 2005).

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(19) On 8th Feb, 2005 it was Tuesday. What was the day of the week on 8th Feb, 2004?

[A] Tuesday

[B] Monday

[C] Sunday

[D] Wednesday

Answer : [C]

Explanation:
The year 2004 is a leap year. It has 2 odd days.
∴ The day on 8th Feb, 2004 is 2 days before the day on 8th Feb, 2005.
Hence, this day is Sunday.

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(20) January 1, 2007 was Monday. What day of the week lies on Jan. 1, 2008?

[A] Monday

[B] Tuesday

[C] Wednesday

[D] Sunday

Answer : [B]

Explanation:
The year 2007 is an ordinary year. So, it has 1 odd day.
1st day of the year 2007 was Monday.
1st day of the year 2008 will be 1 day beyond Monday.
Hence, it will be Tuesday.
