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BOM Math Aptitude Sample Paper 2016 PDF Download

(1) By investing Rs. 1620 in 8% stock, Michael earns Rs. 135. The stock is then quoted at:

[A] Rs. 80

[B] Rs. 96

[C] Rs. 106

[D] Rs. 108

Answer : [B]

Explanation:
To earn Rs. 135, investment = Rs. 1620.
To earn Rs. 8, investment = Rs. $\left(\frac{1620}{135} \times 8\right)$ = Rs. 96.

∴ Market value of Rs. 100 stock = Rs. 96.

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(2) A 6% stock yields 8%. The market value of the stock is:

[A] Rs. 48

[B] Rs. 75

[C] Rs. 96

[D] Rs. 133.33

Answer : [B]

Explanation:
For an income of Rs. 8, investment = Rs. 100.
For an income of Rs. 6, investment = Rs. $\left(\frac{100}{8} \times 6\right)$ = Rs. 75.

∴ Market value of Rs. 100 stock = Rs. 75.

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(3) 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).
∴ $\frac{12}{120} \times x + \frac{15}{125} \times (12000 - x) = 1360$.

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

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

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(4)

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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(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) From a point P on a level ground, the angle of elevation of the top tower is 30?. If the tower is 100 m high, the distance of point P from the foot of the tower is:

[A] 149 m

[B] 156 m

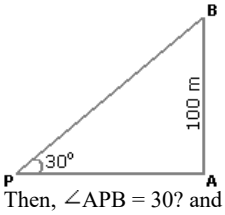
[C] 173 m

[D] 200 m

Answer : [C]

Explanation:

Let AB be the tower.



Then, $\angle$APB = 30? and AB = 100 m.

$\frac{AB}{AP}$ = tan 30? = $\frac{1}{3}$

$\Rightarrow$ AP = (AB x 3) m

= 100 3 m

= (100 x 1.73) m

= 173 m.

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(7) An observer 1.6 m tall is 20 3 away from a tower. The angle of elevation from his eye to the top of the tower is 30?. The heights of the tower is:

[A] 21.6 m

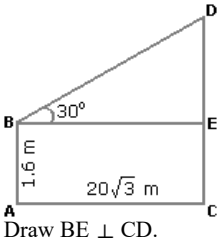
[B] 23.2 m

[C] 24.72 m

[D] None of these

Answer : [A]

Explanation:
Let AB be the observer and CD be the tower.



Draw BE ⊥ CD.
Then, CE = AB = 1.6 m,
BE = AC = 20 3 m.

$\frac{DE}{BE} = \tan 30^\circ = \frac{1}{3}$

$\Rightarrow DE = \frac{20\ 3}{3} m = 20$ m.

$\therefore$ CD = CE + DE = (1.6 + 20) m = 21.6 m.

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(8) Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30? and 45? respectively. If the lighthouse is 100 m high, the distance between the two ships is:

[A] 173 m

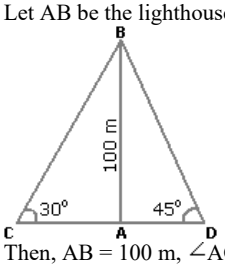
[B] 200 m

[C] 273 m

[D] 300 m

Answer : [C]

Explanation:
Let AB be the lighthouse and C and D be the positions of the ships.



Then, AB = 100 m, ∠ACB = 30? and ∠ADB = 45?.

$\frac{AB}{AC} = \tan 30^\circ = \frac{1}{3} \Rightarrow AC = AB \times 3 = 100\ 3$ m.

$\frac{AB}{AD} = \tan 45^\circ = 1 \Rightarrow AD = AB = 100$ m.

$\therefore$ CD = (AC + AD) = (100 3 + 100) m

= 100(3 + 1)

= (100 x 2.73) m

= 273 m.

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(9) Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

[A] 2 : 3 : 4

[B] 6 : 7 : 8

[C] 6 : 8 : 9

[D] None of these

Answer : [A]

Explanation:
Originally, let the number of seats for Mathematics, Physics and Biology be $5x$, $7x$ and $8x$ respectively.
Number of increased seats are (140% of $5x$), (150% of $7x$) and (175% of $8x$).
$\Rightarrow \left(\frac{140}{100} \times 5x\right)$, $\left(\frac{150}{100} \times 7x\right)$ and $\left(\frac{175}{100} \times 8x\right)$

$\Rightarrow 7x, \frac{21x}{2}$ and $14x$.

$\therefore$ The required ratio = $7x : \frac{21x}{2} : 14x$

$\Rightarrow 14x : 21x : 28x$
$\Rightarrow 2 : 3 : 4$.

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(10) A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share?

[A] Rs. 500

[B] Rs. 1500

[C] Rs. 2000

[D] None of these

Answer : [C]

Explanation:
Let the shares of A, B, C and D be Rs. $5x$, Rs. $2x$, Rs. $4x$ and Rs. $3x$ respectively.
Then, $4x - 3x = 1000$
$\Rightarrow x = 1000$.
$\therefore$ B's share = Rs. $2x$ = Rs. (2 x 1000) = Rs. 2000.

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(11) Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

[A] 2 : 5

[B] 3 : 5

[C] 4 : 5

[D] 6 : 7

Answer : [C]

Explanation:
Let the third number be x.
Then, first number = 120% of $x = \frac{120x}{100} = \frac{6x}{5}$

Second number = 150% of $x = \frac{150x}{100} = \frac{3x}{2}$

$\therefore$ Ratio of first two numbers = $\left(\frac{6x}{5} : \frac{3x}{2}\right) = 12x : 15x = 4 : 5$.

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(12) In a mixture 60 litres, the ratio of milk and water 2 : 1. If the this ratio is to be 1 : 2, then the quanity of water to be further added is:

[A] 20 litres

[B] 30 litres

[C] 40 litres

[D] 60 litres

Answer : [D]

Explanation:

Quantity of milk = $\left(60 \times \frac{2}{3}\right)$ litres = 40 litres.

Quantity of water in it = (60- 40) litres = 20 litres.
New ratio = 1 : 2
Let quantity of water to be added further be x litres.
Then, milk : water = $\left(\frac{40}{20 + x}\right)$.

Now, $\left(\frac{40}{20 + x}\right) = \frac{1}{2}$

$\Rightarrow 20 + x = 80$
$\Rightarrow x = 60.$
$\therefore$ Quantity of water to be added = 60 litres.

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(13) Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's salary?

[A] Rs. 17,000

[B] Rs. 20,000

[C] Rs. 25,500

[D] Rs. 38,000

Answer : [D]

Explanation:
Let the original salaries of Ravi and Sumit be Rs. $2x$ and Rs. $3x$ respectively.
Then, $\frac{2x + 4000}{3x + 4000} = \frac{40}{57}$

$\Rightarrow 57(2x + 4000) = 40(3x + 4000)$
$\Rightarrow 6x = 68{,}000$
$\Rightarrow 3x = 34{,}000$
Sumit's present salary = $(3x + 4000)$ = Rs.(34000 + 4000) = Rs. 38,000.

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(14) In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there is Rs. 30 in all, how many 5 p coins are there?

[A] 50

[B] 100

[C] 150

[D] 200

Answer : [C]

Explanation:
Let the number of 25 p, 10 p and 5 p coins be x, $2x$, $3x$ respectively.
Then, sum of their values = Rs. $\left(\frac{25x}{100} + \frac{10 \times 2x}{100} + \frac{5 \times 3x}{100}\right)$ = Rs. $\frac{60x}{100}$

$\therefore \frac{60x}{100} = 30 \Leftrightarrow x = \frac{30 \times 100}{60} = 50.$

Hence, the number of 5 p coins = (3 x 50) = 150.

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(15) Two number are in the ratio 3 : 5. If 9 is subtracted from each, the new numbers are in the ratio 12 : 23. The smaller number is:

[A] 27

[B] 33

[C] 49

[D] 55

Answer : [B]

Explanation:
Let the numbers be $3x$ and $5x$.
Then, $\frac{3x - 9}{5x - 9} = \frac{12}{23}$

$\Rightarrow 23(3x - 9) = 12(5x - 9)$
$\Rightarrow 9x = 99$
$\Rightarrow x = 11.$
$\therefore$ The smaller number = (3 x 11) = 33.

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(16) 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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(17) 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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(18) What is the least number of squares tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad?

[A] 814

[B] 820

[C] 840

[D] 844

Answer : [A]

Explanation:
Length of largest tile = H.C.F. of 1517 cm and 902 cm = 41 cm.
Area of each tile = (41 x 41) cm^2.
$\therefore$ Required number of tiles = $\left(\frac{1517 \times 902}{41 \times 41}\right) = 814$.

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(19) 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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(20) 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.
