

Book For  
Pune Mahanagar Parivahan Mahamandal Limited (PMPML)



PMPML Driver Quantitative Aptitude Sample Paper



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(1) If  $\log 27 = 1.431$ , then the value of  $\log 9$  is:

[A] 0.934

[B] 0.945

[C] 0.954

[D] 0.958

**Answer : [C]**

**Explanation:**

$$\log 27 = 1.431$$

$$\Rightarrow \log (3^3) = 1.431$$

$$\Rightarrow 3 \log 3 = 1.431$$

$$\Rightarrow \log 3 = 0.477$$

$$\therefore \log 9 = \log(3^2) = 2 \log 3 = (2 \times 0.477) = 0.954.$$

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(2) Which of the following statements is not correct?

[A]  $\log_{10} 10 = 1$

[B]  $\log (2 + 3) = \log (2 \times 3)$

[C]  $\log_{10} 1 = 0$

[D]  $\log (1 + 2 + 3) = \log 1 + \log 2 + \log 3$

**Answer : [B]**

**Explanation:**

(a) Since  $\log_a a = 1$ , so  $\log_{10} 10 = 1$ .

(b)  $\log (2 + 3) = \log 5$  and  $\log (2 \times 3) = \log 6 = \log 2 + \log 3$

$$\therefore \log (2 + 3) \neq \log (2 \times 3)$$

(c) Since  $\log_a 1 = 0$ , so  $\log_{10} 1 = 0$ .

(d)  $\log (1 + 2 + 3) = \log 6 = \log (1 \times 2 \times 3) = \log 1 + \log 2 + \log 3$ .

So, (b) is incorrect.

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(3) If  $\log_{10} 2 = 0.3010$ , then  $\log_2 10$  is equal to:

[A]

$\frac{699}{301}$

301

[B]

$\frac{1000}{301}$

301

[C] 0.3010

[D] 0.6990

**Answer : [B]**

**Explanation:**

$$\log_2 10 = \frac{1}{\log_{10} 2} = \frac{1}{0.3010} = \frac{10000}{3010} = \frac{1000}{301}.$$

(4) If  $\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$ , then  $x$  is equal to:

- [A] 1
- [B] 3
- [C] 5
- [D] 10

**Answer : [B]**

**Explanation:**

$$\begin{aligned}\log_{10} 5 + \log_{10} (5x + 1) &= \log_{10} (x + 5) + 1 \\ \Rightarrow \log_{10} 5 + \log_{10} (5x + 1) &= \log_{10} (x + 5) + \log_{10} 10 \\ \Rightarrow \log_{10} [5(5x + 1)] &= \log_{10} [10(x + 5)] \\ \Rightarrow 5(5x + 1) &= 10(x + 5) \\ \Rightarrow 5x + 1 &= 2x + 10 \\ \Rightarrow 3x &= 9 \\ \Rightarrow x &= 3.\end{aligned}$$

(5) The value of  $\log_2 16$  is:

- [A]  $\frac{1}{8}$
- [B] 4
- [C] 8
- [D] 16

**Answer : [B]**

**Explanation:**

$$\begin{aligned}\text{Let } \log_2 16 &= n. \\ \text{Then, } 2^n &= 16 = 2^4 \Rightarrow n = 4. \\ \therefore \log_2 16 &= 4.\end{aligned}$$

(6) In order to obtain an income of Rs. 650 from 10% stock at Rs. 96, one must make an investment of:

- [A] Rs. 3100
- [B] Rs. 6240
- [C] Rs. 6500
- [D] Rs. 9600

**Answer : [B]**

**Explanation:**

$$\begin{aligned}\text{To obtain Rs. 10, investment} &= \text{Rs. } 96. \\ \text{To obtain Rs. 650, investment} &= \text{Rs. } \left( \frac{96}{10} \times 650 \right) = \text{Rs. } 6240.\end{aligned}$$

(7) A man buys Rs. 20 shares paying 9% dividend. The man wants to have an interest of 12% on his money. The market value of each share is:

[A] Rs. 12

[B] Rs. 15

[C] Rs. 18

[D] Rs. 21

**Answer : [B]**

**Explanation:**

$$\text{Dividend on Rs. 20} = \text{Rs.} \left( \frac{9}{100} \times 20 \right) = \text{Rs.} \frac{9}{5}.$$

Rs. 12 is an income on Rs. 100.

$$\therefore \text{Rs.} \frac{9}{5} \text{ is an income on Rs.} \left( \frac{100}{12} \times \frac{9}{5} \right) = \text{Rs.} 15.$$

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**(8) 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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**(9) A man invests some money partly in 9% stock at 96 and partly in 12% stock at 120. To obtain equal dividends from both, he must invest the money in the ratio:**

[A] 3 : 4

[B] 3 : 5

[C] 4 : 5

[D] 16 : 15

**Answer : [D]**

**Explanation:**

$$\text{For an income of Re. 1 in 9% stock at 96, investment} = \text{Rs.} \left( \frac{96}{9} \right) = \text{Rs.} \frac{32}{3}$$

$$\text{For an income Re. 1 in 12% stock at 120, investment} = \text{Rs.} \left( \frac{120}{12} \right) = \text{Rs.} 10.$$

$$\therefore \text{Ratio of investments} = \frac{32}{3} : 10 = 32 : 30 = 16 : 15.$$

(10) 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.  $(12000 - x)$ .

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

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

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

$$\Rightarrow x = 4000.$$

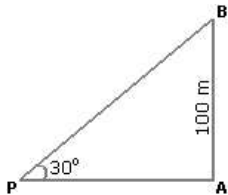
(11) From a point P on a level ground, the angle of elevation of the top tower is  $30^\circ$ . If the tower is 100 m high, the distance of point P from the foot of the tower is:

- [A] 149 m
- [B] 156 m
- [C] 173 m
- [D] 200 m

Answer : [C]

**Explanation:**

Let AB be the tower.



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

$$\frac{AB}{AP} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$\Rightarrow AP = (AB \times \sqrt{3}) \text{ m}$$

$$= 100 \sqrt{3} \text{ m}$$

$$= (100 \times 1.73) \text{ m}$$

$$= 173 \text{ m.}$$

(12) An observer 1.6 m tall is 20 m away from a tower. The angle of elevation from his eye to the top of the tower is  $30^\circ$ . The height of the tower is:

- [A] 21.6 m

[B] 23.2 m

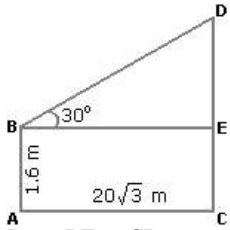
[C] 24.72 m

[D] None of these

**Answer : [A]**

**Explanation:**

Let AB be the observer and CD be the tower.



Draw  $BE \perp CD$ .

Then,  $CE = AB = 1.6$  m,

$BE = AC = 20\sqrt{3}$  m.

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

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

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

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**(13) The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:**

[A] 2.3 m

[B] 4.6 m

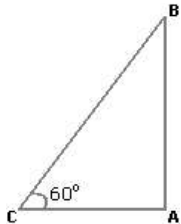
[C] 7.8 m

[D] 9.2 m

**Answer : [D]**

**Explanation:**

Let AB be the wall and BC be the ladder.



Then,  $\angle ACB = 60^\circ$  and  $AC = 4.6$  m.

$$\frac{AC}{BC} = \cos 60^\circ = \frac{1}{2}$$

$$\Rightarrow BC = 2 \times AC$$

$$= (2 \times 4.6) \text{ m}$$

$$= 9.2 \text{ m.}$$

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**(14) The angle of elevation of the sun, when the length of the shadow of a tree is 3 times the height of the tree, is:**







