Book For

The Indian Navy

Indian Navy Aptitude Sample Paper 2016 PDF Download

(1)

$\frac{\log 8}{\log 8}$ is equal to:

[A]
$\frac{1}{8}$

[B]
$\frac{1}{4}$

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

[D]
$\frac{1}{8}$

Answer : [C]

Explanation:

$\frac{\log 8}{\log 8} = \frac{\log (8)^{1/2}}{\log 8} = \frac{\frac{1}{2}\log 8}{\log 8} = \frac{1}{2}$.

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(2) 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 x 0.477) = 0.954.

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

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

[B] log (2 + 3) = log (2 x 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 x 3) = log 6 = log 2 + log 3
$\therefore$ log (2 + 3) $\neq$ log (2 x 3)
(c) Since $\log_a 1 = 0$, so $\log_{10} 1 = 0$.
(d) log (1 + 2 + 3) = log 6 = log (1 x 2 x 3) = log 1 + log 2 + log 3.
So, (b) is incorrect.

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(4)

If $\log_{10} 7 = a$, then $\log_{10}\left(\frac{1}{70}\right)$ is equal to:

[A] - $(1 + a)$

[B] $(1 + a)^{-1}$

[C] $\frac{a}{10}$

[D] $\frac{1}{10a}$

Answer : [A]

Explanation:

$\log_{10}\left(\frac{1}{70}\right) = \log_{10} 1 - \log_{10} 70$

$= - \log_{10} (7 \times 10)$

$= - (\log_{10} 7 + \log_{10} 10)$

$= - (a + 1)$.

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(5) If $\log_{10} 2 = 0.3010$, the value of $\log_{10} 80$ is:

[A] 1.6020

[B] 1.9030

[C] 3.9030

[D] None of these

Answer : [B]

Explanation:

$\log_{10} 80 = \log_{10} (8 \times 10)$

$= \log_{10} 8 + \log_{10} 10$

$= \log_{10} (2^3) + 1$

$= 3 \log_{10} 2 + 1$

$= (3 \times 0.3010) + 1$

$= 1.9030$.

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

[A] $\frac{699}{301}$

[B] $\frac{1000}{301}$

[C] 0.3010

[D] 0.6990

Answer : [B]

Explanation:

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

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(7) If log 2 = 0.30103, the number of digits in 2^{64} is:

[A] 18

[B] 19

[C] 20

[D] 21

Answer : [C]

Explanation:
log (2^{64})= 64 x log 2

= (64 x 0.30103)

= 19.26592

Its characteristic is 19.
Hence, then number of digits in 2^{64} is 20.

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

[A] $\frac{1}{8}$

[B] 4

[C] 8

[D] 16

Answer : [B]

Explanation:
Let $\log_2 16 = n$.
Then, $2^n = 16 = 2^4 \Rightarrow n = 4$.
$\because \log_2 16 = 4$.

(9) 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

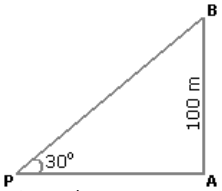
[B] 156 m

[C] 173 m

[D] 200 m

Answer : [C]

Explanation:
Let AB be the tower.



Then, ∠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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(10) A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30? with the man's eye. The man walks some distance towards the tower to watch its top and the angle of the elevation becomes 60?. What is the distance between the base of the tower and the point P?

[A] 4 3 units

[B] 8 units

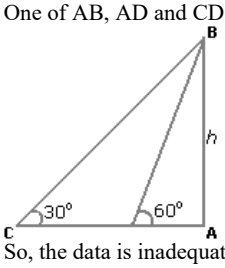
[C] 12 units

[D] Data inadequate

[E] None of these

Answer : [D]

Explanation:
One of AB, AD and CD must have given.



So, the data is inadequate.

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(11) 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

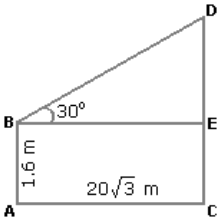
[B] 23.2 m

[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.

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

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

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

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(12) 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

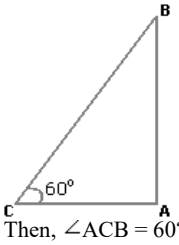
[B] 4.6 m

[C] 7.8 m

[D] 9.2 m

Answer : [D]

Explanation:
Let AB be the wall and BC be the ladder.



Then, ∠ACB = 60? and AC = 4.6 m.

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

$\Rightarrow BC = 2 \times AC$

$= (2 \times 4.6)$ m

$= 9.2$ m.

---

(13) 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

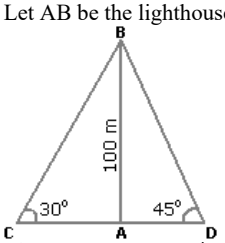
[B] 200 m

[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?.

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

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

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

$= 100(\ 3 + 1)$

$= (100 \times 2.73)$ m

$= 273$ m.

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

[A] 30?

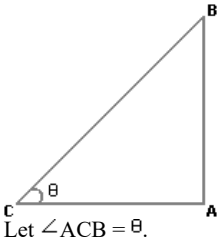
[B] 45?

[C] 60?

[D] 90?

Answer : [A]

Explanation:
Let AB be the tree and AC be its shadow.



Let $\angle ACB = \theta$.

Then, $\frac{AC}{AB} = 3 \Rightarrow \cot\theta = 3$

$\therefore \theta = 30?$.

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(15) 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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(16) There are two examinations rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B. The number of students in room A is:

[A] 20

[B] 80

[C] 100

[D] 200

Answer : [C]

Explanation:
Let the number of students in rooms A and B be x and y respectively.
Then, $x - 10 = y + 10 \Rightarrow x - y = 20$ .... (i)
and $x + 20 = 2(y - 20) \Rightarrow x - 2y = -60$ .... (ii)
Solving (i) and (ii) we get: $x = 100$, $y = 80$.
$\therefore$ The required answer A = 100.

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(17) A fires 5 shots to B's 3 but A kills only once in 3 shots while B kills once in 2 shots. When B has missed 27 times, A has killed:

[A] 30 birds

[B] 60 birds

[C] 72 birds

[D] 90 birds

Answer : [A]

Explanation:
Let the total number of shots be x. Then,

Shots fired by A = $\frac{5}{8}x$

Shots fired by B = $\frac{3}{8}x$

Killing shots by A = $\frac{1}{3}$ of $\frac{5}{8}x$ = $\frac{5}{24}x$

Shots missed by B = $\frac{1}{2}$ of $\frac{3}{8}x$ = $\frac{3}{16}x$

$\therefore$ $\frac{3x}{16} = 27$ or $x = \left(\frac{27 \times 16}{3}\right) = 144.$

Birds killed by A = $\frac{5x}{24} = \left(\frac{5}{24} \times 144\right) = 30.$

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(18)
$\frac{(469 + 174)^2 - (469 - 174)^2}{(469 \times 174)} = ?$

[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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(19) In a regular week, there are 5 working days and for each day, the working hours are 8. A man gets Rs. 2.40 per hour for regular work and Rs. 3.20 per hours for overtime. If he earns Rs. 432 in 4 weeks, then how many hours does he work for ?

[A] 160

[B] 175

[C] 180

[D] 195

Answer : [B]

Explanation:
Suppose the man works overtime for x hours.
Now, working hours in 4 weeks = (5 x 8 x 4) = 160.
$\therefore$ 160 x 2.40 + x x 3.20 = 432
$\Rightarrow$ 3.20x = 432 - 384 = 48
$\Rightarrow$ x = 15.
Hence, total hours of work = (160 + 15) = 175.

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(20) Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. Total how many notebooks were distributed ?

[A] 256

[B] 432

[C] 512

[D] 640

[E] None of these

Answer : [C]

Explanation:
Let total number of children be x.
Then, $x \times \frac{1}{8}x = \frac{x}{2} \times 16 \Leftrightarrow x = 64$.

$\therefore$ Number of notebooks $= \frac{1}{8}x^2 = \left(\frac{1}{8} \times 64 \times 64\right) = 512$.