Book For

National Insurance Company Limited

NICL AO Aptitude Sample Paper Main Exam

(1) A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

[A] 12 days

[B] 15 days

[C] 16 days

[D] 18 days

Answer : [B]

Explanation:

A's 2 day's work = $\left(\dfrac{1}{20} \times 2\right) = \dfrac{1}{10}$.

(A + B + C)'s 1 day's work = $\left(\dfrac{1}{20} + \dfrac{1}{30} + \dfrac{1}{60}\right) = \dfrac{6}{60} = \dfrac{1}{10}$.

Work done in 3 days = $\left(\dfrac{1}{10} + \dfrac{1}{10}\right) = \dfrac{1}{5}$.

Now, $\dfrac{1}{5}$ work is done in 3 days.

∴ Whole work will be done in (3 x 5) = 15 days.

(2) A can do a certain work in the same time in which B and C together can do it. If A and B together could do it in 10 days and C alone in 50 days, then B alone could do it in:

[A] 15 days

[B] 20 days

[C] 25 days

[D] 30 days

Answer : [C]

Explanation:

(A + B)'s 1 day's work = $\dfrac{1}{10}$

C's 1 day's work = $\dfrac{1}{50}$

(A + B + C)'s 1 day's work = $\left(\dfrac{1}{10} + \dfrac{1}{50}\right) = \dfrac{6}{50} = \dfrac{3}{25}$. .... (i)

A's 1 day's work = (B + C)'s 1 day's work .... (ii)

From (i) and (ii), we get: 2 x (A's 1 day's work) = $\dfrac{3}{25}$

$\Rightarrow$ A's 1 day's work = $\dfrac{3}{50}$.

∴ B's 1 day's work $\left(\dfrac{1}{10} - \dfrac{3}{50}\right) = \dfrac{2}{50} = \dfrac{1}{25}$.

So, B alone could do the work in 25 days.

(3) 4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?

[A] 35

[B] 40

[C] 45

[D] 50

Answer : [B]

Explanation:
Let 1 man's 1 day's work = x and 1 woman's 1 day's work = y.

Then, $4x + 6y = \dfrac{1}{8}$ and $3x + 7y = \dfrac{1}{10}$.

Solving the two equations, we get: $x = \dfrac{11}{400}$, $y = \dfrac{1}{400}$

∴ 1 woman's 1 day's work = $\dfrac{1}{400}$.

⟹ 10 women's 1 day's work = $\left(\dfrac{1}{400} \times 10 \right) = \dfrac{1}{40}$.

Hence, 10 women will complete the work in 40 days.

(4) A and B together can do a piece of work in 30 days. A having worked for 16 days, B finishes the remaining work alone in 44 days. In how many days shall B finish the whole work alone?

[A] 30 days

[B] 40 days

[C] 60 days

[D] 70 days

Answer : [C]

Explanation:
Let A's 1 day's work = x and B's 1 day's work = y.

Then, $x + y = \dfrac{1}{30}$ and $16x + 44y = 1$.

Solving these two equations, we get: $x = \dfrac{1}{60}$ and $y = \dfrac{1}{60}$

∴ B's 1 day's work = $\dfrac{1}{60}$.

Hence, B alone shall finish the whole work in 60 days.

(5) A and B can do a work in 8 days, B and C can do the same work in 12 days. A, B and C together can finish it in 6 days. A and C together will do it in :

[A] 4 days

[B] 6 days

[C] 8 days

[D] 12 days

Answer : [C]

Explanation:
(A + B + C)'s 1 day's work = $\frac{1}{6}$;

(A + B)'s 1 day's work = $\frac{1}{8}$;

(B + C)'s 1 day's work = $\frac{1}{12}$.

$\therefore$ (A + C)'s 1 day's work $= \left(2 \times \frac{1}{6}\right) - \left(\frac{1}{8} + \frac{1}{12}\right)$

$$= \left(\frac{1}{3} - \frac{5}{24}\right)$$

$$= \frac{3}{24}$$

$$= \frac{1}{8}.$$

So, A and C together will do the work in 8 days.

(6) 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?
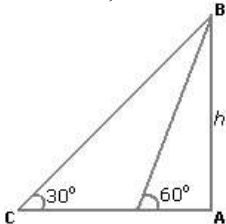
[A] 4 3 units

[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.

(7) 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:
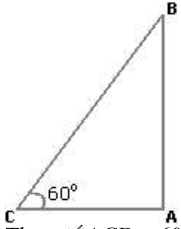
[A] 2.3 m

[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.

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

$\implies$ BC = 2 x AC

= (2 x 4.6) m

= 9.2 m.

(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:
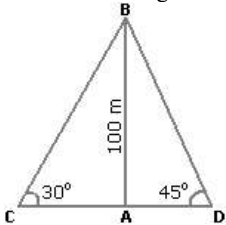
[A] 173 m

[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?.

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

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

∴ CD = (AC + AD) = (100 3 + 100) m

= 100(3 + 1)

= (100 x 2.73) m

= 273 m.

(9) The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is:

[A] 625

[B] 630

[C] 640

[D] 650

Answer : [A]

Explanation:
Let the sum be Rs. x. Then,

$$\text{C.I.} = \left[x \left(1 + \frac{4}{100} \right)^2 - x \right] = \left(\frac{676}{625}x - x \right) = \frac{51}{625}x.$$

$$\text{S.I.} = \left(\frac{x \times 4 \times 2}{100} \right) = \frac{2x}{25}.$$

$$\therefore \frac{51x}{625} - \frac{2x}{25} = 1$$

$$\Rightarrow x = 625.$$

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(10) 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.

$$\therefore R = \left(\frac{100 \times 60}{100 \times 6} \right) = 10\% \text{ p.a.}$$

Now, P = Rs. 12000. T = 3 years and R = 10% p.a.

$$\therefore \text{C.I.} = \text{Rs.} \left[12000 \times \left\{ \left(1 + \frac{10}{100} \right)^3 - 1 \right\} \right]$$

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

$$= 3972.$$

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(11) 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.

(12) 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%

(13) 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:

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

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

$= $ Rs. 35123.20

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

(14) 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:

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

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

∴ Difference = Rs. (123 - 120) = Rs. 3.

(15) Simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs. 4000 for 2 years at 10% per annum. The sum placed on simple interest is:

[A] Rs. 1550

[B] Rs. 1650

[C] Rs. 1750

[D] Rs. 2000

Answer : [C]

Explanation:

C.I. = Rs. $\left[4000 \times \left(1 + \dfrac{10}{100} \right)^2 - 4000 \right]$

= Rs. $\left(4000 \times \dfrac{11}{10} \times \dfrac{11}{10} - 4000 \right)$

= Rs. 840.

∴ Sum = Rs. $\left(\dfrac{420 \times 100}{3 \times 8} \right)$ = Rs. 1750.

(16) A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

[A] 8.5 km/hr

[B] 9 km/hr

[C] 10 km/hr

[D] 12.5 km/hr

Answer : [C]

Explanation:
Man's rate in still water = (15 - 2.5) km/hr = 12.5 km/hr.
Man's rate against the current = (12.5 - 2.5) km/hr = 10 km/hr.

(17) In one hour, a boat goes 11 km/hr along the stream and 5 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

[A] 3 km/hr

[B] 5 km/hr

[C] 8 km/hr

[D] 9 km/hr

Answer : [C]

Explanation:

Speed in still water = $\frac{1}{2}$(11 + 5) kmph = 8 kmph.

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(18) A boat running downstream covers a distance of 16 km in 2 hours while for covering the same distance upstream, it takes 4 hours. What is the speed of the boat in still water?

[A] 4 km/hr

[B] 6 km/hr

[C] 8 km/hr

[D] Data inadequate

Answer : [B]

Explanation:

Rate downstream = $\left(\frac{16}{2}\right)$kmph = 8 kmph.

Rate upstream = $\left(\frac{16}{4}\right)$kmph = 4 kmph.

∴ Speed in still water = $\frac{1}{2}$(8 + 4) kmph = 6 kmph.

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(19) A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?

[A] 2.4 km

[B] 2.5 km

[C] 3 km

[D] 3.6 km

Answer : [A]

Explanation:

Speed downstream = (5 + 1) kmph = 6 kmph.
Speed upstream = (5 - 1) kmph = 4 kmph.
Let the required distance be x km.

Then, $\frac{x}{6} + \frac{x}{4} = 1$

$\Rightarrow 2x + 3x = 12$
$\Rightarrow 5x = 12$
$\Rightarrow x = 2.4$ km.

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(20) Speed of a boat in standing water is 9 kmph and the speed of the stream is 1.5 kmph. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is:

[A] 16 hours

[B] 18 hours

[C] 20 hours

[D] 24 hours

Answer : [D]

Explanation:
Speed upstream = 7.5 kmph.
Speed downstream = 10.5 kmph.

$\therefore$ Total time taken = $\left(\dfrac{105}{7.5} + \dfrac{105}{10.5} \right)$ hours = 24 hours.