Book For

Union Public Service Commission

CDS IMA Aptitude Sample Paper

(1) A can lay railway track between two given stations in 16 days and B can do the same job in 12 days. With help of C, they did the job in 4 days only. Then, C alone can do the job in:

[A]

$9\dfrac{1}{5}$ days

[B]

$9\dfrac{2}{5}$ days

[C]

$9\dfrac{3}{5}$ days

[D] 10

Answer : [C]

Explanation:

(A + B + C)'s 1 day's work = $\dfrac{1}{4}$,

A's 1 day's work = $\dfrac{1}{16}$,

B's 1 day's work = $\dfrac{1}{12}$.

∴ C's 1 day's work = $\dfrac{1}{4}$ - $\left(\dfrac{1}{16} + \dfrac{1}{12}\right)$ = $\left(\dfrac{1}{4} - \dfrac{7}{48}\right)$ = $\dfrac{5}{48}$.

So, C alone can do the work in $\dfrac{48}{5}$ = $9\dfrac{3}{5}$ days.

(2) 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 = $\dfrac{1}{400}$ x 10 = $\dfrac{1}{40}$.

Hence, 10 women will complete the work in $\dfrac{400}{40}$ days.

(3) X and Y can do a piece of work in 20 days and 12 days respectively. X started the work alone and then after 4 days Y joined him till the completion of the work. How long did the work last?

[A] 6 days

[B] 10 days

[C] 15 days

[D] 20 days

Answer : [B]

Explanation:

Work done by X in 4 days = $\left(\dfrac{1}{20} \times 4 \right) = \dfrac{1}{5}$.

Remaining work = $\left(1 - \dfrac{1}{5} \right) = \dfrac{4}{5}$.

(X + Y)'s 1 day's work = $\left(\dfrac{1}{20} + \dfrac{1}{12} \right) = \dfrac{8}{60} = \dfrac{2}{15}$.

Now, $\dfrac{2}{15}$ work is done by X and Y in 1 day.

So, $\dfrac{4}{5}$ work will be done by X and Y in $\left(\dfrac{15}{2} \times \dfrac{4}{5} \right)$ = 6 days.

Hence, total time taken = (6 + 4) days = 10 days.

(4) A and B can do a piece of work in 30 days, while B and C can do the same work in 24 days and C and A in 20 days. They all work together for 10 days when B and C leave. How many days more will A take to finish the work?

[A] 18 days

[B] 24 days

[C] 30 days

[D] 36 days

Answer : [A]

Explanation:

2(A + B + C)'s 1 day's work = $\left(\dfrac{1}{30} + \dfrac{1}{24} + \dfrac{1}{20} \right) = \dfrac{15}{120} = \dfrac{1}{8}$.

Therefore, (A + B + C)'s 1 day's work = $\dfrac{1}{2 \times 8} = \dfrac{1}{16}$.

Work done by A, B, C in 10 days = $\dfrac{10}{16} = \dfrac{5}{8}$.

Remaining work = $\left(1 - \dfrac{5}{8} \right) = \dfrac{3}{8}$.

A's 1 day's work = $\left(\dfrac{1}{16} - \dfrac{1}{24} \right) = \dfrac{1}{48}$.

Now, $\dfrac{1}{48}$ work is done by A in 1 day.

3   3

So, $\dfrac{}{8}$ work will be done by A in $\left(\dfrac{48 \times \dfrac{}{8}}{}\right)$ = 18 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 = $\dfrac{1}{6}$;

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

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

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

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

$= \dfrac{3}{24}$

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

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

(6) If selling price is doubled, the profit triples. Find the profit percent.

[A]
$66\dfrac{2}{3}$

[B] 100

[C]
$105\dfrac{1}{3}$

[D] 120

Answer : [B]

Explanation:
Let C.P. be Rs. x and S.P. be Rs. y.
Then, $3(y - x) = (2y - x)$ $\Rightarrow y = 2x$.
Profit = Rs. $(y - x)$ = Rs. $(2x - x)$ = Rs. x.
$\therefore$ Profit % = $\left(\dfrac{x}{x} \times 100\right)\%$ = 100%

(7) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

[A] 15

[B] 16

[C] 18

[D] 25

Answer : [B]

Explanation:
Let C.P. of each article be Re. 1 C.P. of x articles = Rs. x.
S.P. of x articles = Rs. 20.
Profit = Rs. (20 - x).
$$\therefore \left(\frac{20 - x}{x} \times 100 = 25 \right)$$

$\Rightarrow 2000 - 100x = 25x$
$125x = 2000$
$\Rightarrow x = 16.$

(8) Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6. Gain percent is:

[A] 30%

[B]
$33\frac{1}{3}\%$

[C] 35%

[D] 44%

Answer : [D]

Explanation:
Suppose, number of articles bought = L.C.M. of 6 and 5 = 30.
C.P. of 30 articles = Rs. $\left(\frac{5}{6} \times 30 \right)$ = Rs. 25.

S.P. of 30 articles = Rs. $\left(\frac{6}{5} \times 30 \right)$ = Rs. 36.

$\therefore$ Gain % = $\left(\frac{11}{25} \times 100 \right)\%$ = 44%.

(9) A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:

[A] No profit, no loss

[B] 5%

[C] 8%

[D] 10%

[E] None of these

Answer : [B]

Explanation:
C.P. of 56 kg rice = Rs. (26 x 20 + 30 x 36) = Rs. (520 + 1080) = Rs. 1600.
S.P. of 56 kg rice = Rs. (56 x 30) = Rs. 1680.

$\therefore$ Gain = $\left(\dfrac{80}{1600} \times 100 \right)$% = 5%.

(10) 100 oranges are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen. The percentage of profit or loss is:

[A] $14\dfrac{2}{7}$% gain

[B] 15% gain

[C] $14\dfrac{2}{7}$% loss

[D] 15 % loss

Answer : [A]

Explanation:

C.P. of 1 orange = Rs. $\left(\dfrac{350}{100} \right)$ = Rs. 3.50

S.P. of 1 orange = Rs. $\left(\dfrac{48}{12} \right)$ = Rs. 4

$\therefore$ Gain% = $\left(\dfrac{0.50}{3.50} \times 100 \right)$% = $\dfrac{100}{7}$% = $14\dfrac{2}{7}$%

(11) If A = x% of y and B = y% of x, then which of the following is true?

[A] A is smaller than B.

[B] A is greater than B

[C] Relationship between A and B cannot be determined.

[D] If x is smaller than y, then A is greater than B.

[E] None of these

Answer : [E]

Explanation:

x% of y = $\left(\dfrac{x}{100} \times y \right)$ = $\left(\dfrac{y}{100} \times x \right)$ = y% of x

$\therefore$ A = B.

(12) A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

[A] 588 apples

[B] 600 apples

[C] 672 apples

[D] 700 apples

Answer : [D]

Explanation:
Suppose originally he had x apples.
Then, $(100 - 40)\%$ of $x = 420$.

$$\Rightarrow \frac{60}{100} \times x = 420$$

$$\Rightarrow x = \left(\frac{420 \times 100}{60}\right) = 700.$$

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(13) If 20% of a = b, then b% of 20 is the same as:

[A] 4% of a

[B] 5% of a

[C] 20% of a

[D] None of these

Answer : [A]

Explanation:
20% of $a = b$ $\Rightarrow$ $\frac{20}{100}a = b.$

$\therefore$ b% of 20 = $\left(\frac{b}{100} \times 20\right)$ = $\left(\frac{20}{100}a \times \frac{1}{100} \times 20\right)$ = $\frac{4}{100}a$ = 4% of a.

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(14)
A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$.
What is the percentage error in the calculation?

[A] 34%

[B] 44%

[C] 54%

[D] 64%

Answer : [D]

Explanation:
Let the number be x.
Then, error = $\frac{5}{3}x - \frac{3}{5}x = \frac{16}{15}x.$

Error% = $\left(\frac{16x}{15} \times \frac{3}{5x} \times 100\right)$% = 64%.

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(15) Rajeev buys good worth Rs. 6650. He gets a rebate of 6% on it. After getting the rebate, he pays sales tax @ 10%. Find the amount he will have to pay for the goods.

[A] Rs. 6876.10

[B] Rs. 6999.20

[C] Rs. 6654

[D] Rs. 7000

Answer : [A]

Explanation:

Rebate = 6% of Rs. 6650 = Rs. $\left(\dfrac{6}{100} \times 6650\right)$ = Rs. 399.

Sales tax = 10% of Rs. (6650 - 399) = Rs. $\left(\dfrac{10}{100} \times 6251\right)$ = Rs. 625.10

$\therefore$ Final amount = Rs. (6251 + 625.10) = Rs. 6876.10

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(16) What is the difference between the compound interests on Rs. 5000 for $1\dfrac{1}{2}$ years at 4% per annum compounded yearly and half-yearly?

[A] Rs. 2.04

[B] Rs. 3.06

[C] Rs. 4.80

[D] Rs. 8.30

Answer : [A]

Explanation:

C.I. when interest compounded yearly = Rs. $\left[5000 \times \left(1 + \dfrac{4}{100}\right) \times \left(1 + \dfrac{\frac{1}{2} \times 4}{100}\right) \right]$

= Rs. $\left(5000 \times \dfrac{26}{25} \times \dfrac{51}{50} \right)$

= Rs. 5304.

C.I. when interest is compounded half-yearly = Rs. $\left[5000 \times \left(1 + \dfrac{2}{100}\right)^3 \right]$

= Rs. $\left(5000 \times \dfrac{51}{50} \times \dfrac{51}{50} \times \dfrac{51}{50} \right)$

= Rs. 5306.04

$\therefore$ Difference = Rs. (5306.04 - 5304) = Rs. 2.04

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(17) A bank offers 5% compound interest calculated on half-yearly basis. A customer deposits Rs. 1600 each on 1st January and 1st July of a year. At the end of the year, the amount he would have gained by way of interest is:

[A] Rs. 120

[B] Rs. 121

[C] Rs. 122

[D] Rs. 123

Answer : [B]

Explanation:

Amount = Rs. $\left[1600 \times \left(1 + \dfrac{5}{2 \times 100}\right)^2 + 1600 \times \left(1 + \dfrac{5}{2 \times 100}\right) \right]$

= Rs. $\left[1600 \times \dfrac{41}{40} \times \dfrac{41}{40} + 1600 \times \dfrac{41}{40} \right]$

41 41

$$= \text{Rs.} \left[1600 \times \frac{}{40} \left(\frac{}{40} + 1 \right) \right]$$

$$= \text{Rs.} \left[\frac{1600 \times 41 \times 81}{40 \times 40} \right]$$

$$= \text{Rs. } 3321.$$

∴ C.I. = Rs. (3321 - 3200) = Rs. 121

(18) Albert invested an amount of Rs. 8000 in a fixed deposit scheme for 2 years at compound interest rate 5 p.c.p.a. How much amount will Albert get on maturity of the fixed deposit?

[A] Rs. 8600

[B] Rs. 8620

[C] Rs. 8820

[D] None of these

Answer : [C]

Explanation:

$$\text{Amount} = \text{Rs.} \left[8000 \times \left(1 + \frac{5}{100} \right)^2 \right]$$

$$= \text{Rs.} \left(8000 \times \frac{21}{20} \times \frac{21}{20} \right)$$

$$= \text{Rs. } 8820.$$

(19) 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:

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

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

$$= \text{Rs. } 35123.20$$

∴ C.I. = Rs. (35123.20 - 25000) = Rs. 10123.20

(20) The compound interest on a certain sum for 2 years at 10% per annum is Rs. 525. The simple interest on the same sum for double the time at half the rate percent per annum is:

[A] Rs. 400

[B] Rs. 500

[C] Rs. 600

[D] Rs. 800

Answer : [B]

Explanation:

Let the sum be Rs. P.

Then, $\left[P \left(1 + \dfrac{10}{100} \right)^2 - P \right] = 525$

$\Rightarrow P \left[\left(\dfrac{11}{10} \right)^2 - 1 \right] = 525$

$\Rightarrow P = \left(\dfrac{525 \times 100}{21} \right) = 2500.$

$\therefore$ Sum = Rs . 2500.

So, S.I. = Rs. $\left(\dfrac{2500 \times 5 \times 4}{100} \right)$ = Rs. 500