Book For

Repco Home Finance

RHF Math Aptitude Sample Paper 2016 PDF Download

(1) The banker's discount on a sum of money for $1\frac{1}{2}$ years is Rs. 558 and the true discount on the same sum for 2 years is Rs. 600. The rate percent is:

[A] 10%

[B] 13%

[C] 12%

[D] 15%

Answer : [C]

Explanation:

B.D. for $\frac{3}{2}$ years = Rs. 558.

B.D. for 2 years = Rs. $\left(558 \times \frac{2}{3} \times 2\right)$

             = Rs. 744

T.D. for 2 years = Rs. 600.

∴ Sum = $\frac{\text{B.D. x T.D.}}{\text{B.D. - T.D}}$ = Rs. $\left(\frac{744 \times 600}{144}\right)$ = Rs. 3100.

Thus, Rs. 744 is S.I. on Rs. 3100 for 2 years.

∴ Rate = $\left(\frac{100 \times 744}{3100 \times 2}\right)_{\%}$ = 12%

(2) The present worth of a certain bill due sometime hence is Rs. 800 and the true discount is Rs. 36. The banker's discount is:

[A] Rs. 37

[B] Rs. 37.62

[C] Rs. 34.38

[D] Rs. 38.98

Answer : [B]

Explanation:

B.G. = $\frac{(\text{T.D.})^2}{\text{P.W.}}$ = Rs. $\left(\frac{36 \times 36}{800}\right)$ = Rs. 1.62

∴ B.D. = (T.D. + B.G.) = Rs. (36 + 1.62) = Rs. 37.62

(3)

The banker's discount on a certain sum due 2 years hence is $\frac{11}{10}$ of the true discount.

The rate percent is:

[A] 11%

[B] 10%

[C] 5%

[D] 5.5%

Answer : [C]

Explanation:

Let T.D. be Re. 1.

Then, B.D. = Rs. $\frac{11}{10}$ = Rs. 1.10.

∴ Sum = Rs. $\left(\frac{1.10 \times 1}{1.10 - 1}\right)$ = Rs. $\left(\frac{110}{10}\right)$ = Rs. 11.

∴ S.I. on Rs. 11 for 2 years is Rs. 1.10

          100 x 1.10

$\therefore$ Rate = $\left(\dfrac{}{11 \times 2}\right)_{\%}$ = 5%.

(4) 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.

(5) If $a^x = b^y$, then:

[A]
$\log \dfrac{a}{b} = \dfrac{x}{y}$

[B]
$\dfrac{\log a}{\log b} = \dfrac{x}{y}$

[C]
$\dfrac{\log a}{\log b} = \dfrac{y}{x}$

[D] None of these

Answer : [C]

Explanation:
$a^x = b^y$
$\Rightarrow \log a^x = \log b^y$
$\Rightarrow x \log a = y \log b$
$\Rightarrow \dfrac{\log a}{\log b} = \dfrac{y}{x}$.

(6) A can do a work in 15 days and B in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is :

[A]

$\dfrac{1}{4}$

[B]

$\dfrac{1}{10}$

[C]

$\dfrac{7}{15}$

[D]

$\dfrac{8}{15}$

Answer : [D]

Explanation:

A's 1 day's work = $\frac{1}{15}$;

B's 1 day's work = $\frac{1}{20}$;

(A + B)'s 1 day's work = $\left(\frac{1}{15} + \frac{1}{20}\right) = \frac{7}{60}$.

(A + B)'s 4 day's work = $\left(\frac{7}{60} \times 4\right) = \frac{7}{15}$.

Therefore, Remaining work = $\left(1 - \frac{7}{15}\right) = \frac{8}{15}$.

---

(7) 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, $4x + 6y = \frac{1}{8}$ and $3x + 7y = \frac{1}{10}$.

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

$\therefore$ 1 woman's 1 day's work = $\frac{1}{400}$.

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

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

---

(8) A, B and C can complete a piece of work in 24, 6 and 12 days respectively. Working together, they will complete the same work in:

[A]
$\frac{1}{24}$ day

[B]
$\frac{7}{24}$ day

[C]
$3\frac{3}{7}$ days

[D] 4 days

Answer : [C]

Explanation:

Formula: If A can do a piece of work in n days, then A's 1 day's work = $\frac{1}{n}$.

(A + B + C)'s 1 day's work = $\left(\frac{1}{24} + \frac{1}{6} + \frac{1}{12}\right) = \frac{7}{24}$.

So, all the three together will complete the job in $\left(\frac{24}{7}\right)_{days}$ = $3\frac{3}{7}$ days.

(9) X can do a piece of work in 40 days. He works at it for 8 days and then Y finished it in 16 days. How long will they together take to complete the work?

[A]

$13\frac{1}{3}$ days

[B] 15 days

[C] 20 days

[D] 26 days

Answer : [A]

Explanation:

Work done by X in 8 days = $\left(\frac{1}{40} \times 8\right)$ = $\frac{1}{5}$.

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

Now, $\frac{4}{5}$ work is done by Y in 16 days.

Whole work will be done by Y in $\left(16 \times \frac{5}{4}\right)$ = 20 days.

∵ X's 1 day's work = $\frac{1}{40}$, Y's 1 day's work = $\frac{1}{20}$.

(X + Y)'s 1 day's work = $\left(\frac{1}{40} + \frac{1}{20}\right)$ = $\frac{3}{40}$.

Hence, X and Y will together complete the work in $\left(\frac{40}{3}\right)$ = $13\frac{1}{3}$ days.

(10) A and B can do a job together in 7 days. A is $1\frac{3}{4}$ times as efficient as B. The same job can be done by A alone in :

[A]

$9\frac{1}{3}$ days

[B] 11 days

[C]

$12\frac{1}{4}$ days

[D]

$16\frac{1}{3}$ days

Answer : [B]

Explanation:

(A's 1 day's work) : (B's 1 day's work) = $\frac{7}{4}$: 1 = 7 : 4.

Let A's and B's 1 day's work be $7x$ and $4x$ respectively.

Then, $7x + 4x = \frac{1}{7}$ ⟹ $11x = \frac{1}{7}$ ⟹ $x = \frac{1}{77}$.

∵ A's 1 day's work = $\left(\frac{1}{77} \times 7\right)$ = $\frac{1}{11}$.

(11) In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

[A] 30%

[B] 70%

[C] 100%

[D] 250%

Answer : [B]

Explanation:
Let C.P.= Rs. 100. Then, Profit = Rs. 320, S.P. = Rs. 420.
New C.P. = 125% of Rs. 100 = Rs. 125
New S.P. = Rs. 420.
Profit = Rs. (420 - 125) = Rs. 295.

∴ Required percentage = $\left(\dfrac{295}{420} \times 100\right)_{\%}$ = $\dfrac{1475}{21}$% = 70% (approximately).

(12) 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).

∴ $\left(\dfrac{20 - x}{x} \times 100 = 25\right)$

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

(13) A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle?

[A] Rs. 1090

[B] Rs. 1160

[C] Rs. 1190

[D] Rs. 1202

Answer : [C]

Explanation:
S.P. = 85% of Rs. 1400 = Rs. $\left(\dfrac{85}{100} \times 1400\right)$ = Rs. 1190

(14) A shopkeeper sells one transistor for Rs. 840 at a gain of 20% and another for Rs. 960 at a loss of 4%. His total gain or loss percent is:

[A] $5\dfrac{15}{17}$% loss

[B]

$5\frac{15}{17}$% gain

[C]
$6\frac{2}{3}$% gain

[D] None of these

Answer : [B]

Explanation:

C.P. of 1st transistor = Rs. $\left(\dfrac{100}{120} \times 840\right)$ = Rs. 700.

C.P. of 2nd transistor = Rs. $\left(\dfrac{100}{96} \times 960\right)$ = Rs. 1000

So, total C.P. = Rs. (700 + 1000) = Rs. 1700.
Total S.P. = Rs. (840 + 960) = Rs. 1800.

$\therefore$ Gain % = $\left(\dfrac{100}{1700} \times 100\right)_{\%}$ = $5\frac{15}{17}$%

---

(15) 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,

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

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

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

$\Rightarrow x = 625.$

---

(16) What is the difference between the compound interests on Rs. 5000 for $1\frac{1}{2}$ 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 $= Rs. \left[5000 \times \left(1 + \dfrac{}{100} \right) \right]$

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

$= Rs. 5306.04$

∴ Difference = Rs. (5306.04 - 5304) = Rs. 2.04

(17) 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.

∴ $R = \left(\dfrac{100 \times 60}{100 \times 6} \right) = 10\%$ p.a.

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

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

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

$= 3972.$

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

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

$= Rs. \left[1600 \times \dfrac{41}{40} \left(\dfrac{41}{40} + 1 \right) \right]$

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

$= Rs. 3321.$

∴ C.I. = Rs. (3321 - 3200) = Rs. 121

(19) At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

[A] 6%

[B] 6.5%

[C] 7%

[D] 7.5%

Answer : [A]

Explanation:
Let the rate be R% p.a.

Then, $1200 \times \left(1 + \dfrac{R}{100}\right)^2 = 1348.32$

$\Rightarrow \left(1 + \dfrac{R}{100}\right)^2 = \dfrac{134832}{120000} = \dfrac{11236}{10000}$

$\therefore \left(1 + \dfrac{R}{100}\right)^2 = \left(\dfrac{106}{100}\right)^2$

$\Rightarrow 1 + \dfrac{R}{100} = \dfrac{106}{100}$

$\Rightarrow R = 6\%$

(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