Book For

Institute of Banking Personnel Selection

IBPS PO Math Sample Paper In English 2017

(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. $\left(558 \times \frac{2}{3} \times 2 \right)$

$\quad\quad\quad\quad\quad\quad$ = Rs. 744

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

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

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

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

(2) The banker's discount on Rs. 1600 at 15% per annum is the same as true discount on Rs. 1680 for the same time and at the same rate. The time is:

[A] 3 months

[B] 4 months

[C] 6 months

[D] 8 months

Answer : [B]

Explanation:

S.I. on Rs. 1600 = T.D. on Rs. 1680.

$\therefore$ Rs. 1600 is the P.W. of Rs. 1680, *i.e.,* Rs. 80 is on Rs. 1600 at 15%.

$\therefore$ Time = $\left(\dfrac{100 \times 80}{1600 \times 15} \right)_{\text{year}}$ = $\dfrac{1}{3}$ year = 4 months.

(3) The banker's gain on a sum due 3 years hence at 12% per annum is Rs. 270. The banker's discount is:

[A] Rs. 960

[B] Rs. 840

[C] Rs. 1020

[D] Rs. 760

Answer : [C]

Explanation:

T.D. = $\left(\dfrac{\text{B.G. x 100}}{\text{R x T}} \right)$ = Rs. $\left(\dfrac{270 \times 100}{12 \times 3} \right)$ = Rs. 750.

$\therefore$ B.D. = Rs.(750 + 270) = Rs. 1020.

(4)

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

∴ Rate = $\left(\frac{100 \times 1.10}{11 \times 2}\right)_{\%}$ = 5%.

---

(5) A is thrice as good as workman as B and therefore is able to finish a job in 60 days less than B. Working together, they can do it in:

[A] 20 days

[B]
$22\frac{1}{2}$ days

[C] 25 days

[D] 30 days

Answer : [B]

Explanation:
Ratio of times taken by A and B = 1 : 3.
The time difference is (3 - 1) 2 days while B take 3 days and A takes 1 day.
If difference of time is 2 days, B takes 3 days.

If difference of time is 60 days, B takes $\left(\frac{3}{2} \times 60\right)$ = 90 days.

So, A takes 30 days to do the work.

A's 1 day's work = $\frac{1}{30}$

B's 1 day's work = $\frac{1}{90}$

(A + B)'s 1 day's work = $\left(\frac{1}{30} + \frac{1}{90}\right)$ = $\frac{4}{90}$ = $\frac{2}{45}$

∴ A and B together can do the work in $\frac{45}{2}$ = $22\frac{1}{2}$ days.

---

(6) 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]
$9\frac{1}{5}$ days

[B]
$9\frac{2}{5}$ 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 = $\dfrac{1}{12}$.

$\therefore$ 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.

---

(7) 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.

So, $\dfrac{3}{8}$ work will be done by A in $\left(48 \times \dfrac{3}{8} \right) = 18$ days.

---

(8) 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 = $\frac{1}{8}$;

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

∴ (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.

(9) 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 = $\left(\frac{295}{420} \times 100\right)\%$ = $\frac{1475}{21}\%$ = 70% (approximately).

(10) 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).
∴ $\left(\frac{20 - x}{x} \times 100 = 25\right)$

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

(11) A shopkeeper expects a gain of 22.5% on his cost price. If in a week, his sale was of Rs. 392, what was his profit?

[A] Rs. 18.20

[B] Rs. 70

[C] Rs. 72

[D] Rs. 88.25

Answer : [C]

Explanation:
C.P. = Rs. $\left(\dfrac{100}{122.5} \times 392\right)$ = Rs. $\left(\dfrac{1000}{1225} \times 392\right)$ = Rs. 320

∴ Profit = Rs. (392 - 320) = Rs. 72.

---

(12) When a plot is sold for Rs. 18,700, the owner loses 15%. At what price must that plot be sold in order to gain 15%?

[A] Rs. 21,000

[B] Rs. 22,500

[C] Rs. 25,300

[D] Rs. 25,800

Answer : [C]

Explanation:
85 : 18700 = 115 : x
$\Rightarrow x = \left(\dfrac{18700 \times 115}{85}\right)$ = 25300.

Hence, S.P. = Rs. 25,300.

---

(13) What percentage of numbers from 1 to 70 have 1 or 9 in the unit's digit?

[A] 1

[B] 14

[C] 20

[D] 21

Answer : [C]

Explanation:
Clearly, the numbers which have 1 or 9 in the unit's digit, have squares that end in the digit 1. Such numbers from 1 to 70 are 1, 9, 11, 19, 21, 29, 31, 39, 41, 49, 51, 59, 61, 69.
Number of such number =14
∴ Required percentage = $\left(\dfrac{14}{70} \times 100\right)$% = 20%.

---

(14) Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. The marks obtained by them are:

[A] 39, 30

[B] 41, 32

[C] 42, 33

[D] 43, 34

Answer : [C]

Explanation:
Let their marks be $(x + 9)$ and x.
Then, $x + 9 = \dfrac{56}{100}(x + 9 + x)$

$\Rightarrow 25(x + 9) = 14(2x + 9)$

$\Rightarrow 3x = 99$
$\Rightarrow x = 33$
So, their marks are 42 and 33.

---

(15) Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B. Find the ratio of A : B.

[A] 2 : 3

[B] 1 : 1

[C] 3 : 4

[D] 4 : 3

Answer : [D]

Explanation:

5% of A + 4% of B = $\dfrac{2}{3}$ (6% of A + 8% of B)

$\Rightarrow \dfrac{5}{100} A + \dfrac{4}{100} B = \dfrac{2}{3}\left(\dfrac{6}{100} A + \dfrac{8}{100} B \right)$

$\Rightarrow \dfrac{1}{20} A + \dfrac{1}{25} B = \dfrac{1}{25} A + \dfrac{4}{75} B$

$\Rightarrow \left(\dfrac{1}{20} - \dfrac{1}{25} \right) A = \left(\dfrac{4}{75} - \dfrac{1}{25} \right) B$

$\Rightarrow \dfrac{1}{100} A = \dfrac{1}{75} B$

$\dfrac{A}{B} = \dfrac{100}{75} = \dfrac{4}{3}.$

∵ Required ratio = 4 : 3

---

(16) The population of a town increased from 1,75,000 to 2,62,500 in a decade. The average percent increase of population per year is:

[A] 4.37%

[B] 5%

[C] 6%

[D] 8.75%

Answer : [B]

Explanation:
Increase in 10 years = (262500 - 175000) = 87500.

Increase% = $\left(\dfrac{87500}{175000} \times 100 \right)$% = 50%.

∵ Required average = $\left(\dfrac{50}{10} \right)$% = 5%.

---

(17) 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
$$= Rs. \left[5000 \times \left(1 + \frac{4}{100}\right) \times \left(1 + \frac{\frac{1}{2} \times 4}{100}\right) \right]$$

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

$$= Rs.\ 5304.$$

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

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

$$= Rs.\ 5306.04$$

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

(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:

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

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

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

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

$$= Rs.\ 3321.$$

∴ C.I. = Rs. (3321 - 3200) = Rs. 121

(19) 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
$$= Rs. \left[100 \times \left(1 + \frac{3}{100}\right)^2 \right] = Rs.\ 106.09$$

∴ Effective rate = (106.09 - 100)% = 6.09%

(20) 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.