# Book For

## The Reserve Bank of India



## RBI Assistance Pre. Exam Math Sample Paper 2017

**(1) The banker's gain of a certain sum due 2 years hence at 10% per annum is Rs. 24. The present worth is:**

[A] Rs. 480

[B] Rs. 520

[C] Rs. 600

[D] Rs. 960

**Answer : [C]**

**Explanation:**

$$\text{T.D.} = \left(\frac{\text{B.G. x 100}}{\text{Rate x Time}}\right) = \text{Rs.} \left(\frac{24 \text{ x } 100}{10 \text{ x } 2}\right) = \text{Rs. } 120.$$

$$\therefore \quad \text{P.W.} = \frac{100 \text{ x T.D.}}{\text{Rate x Time}} = \text{Rs.} \left(\frac{100 \text{ x } 120}{10 \text{ x } 2}\right) = \text{Rs. } 600.$$

**(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%.

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

**(3) 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:**

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

$\therefore$ B.D. = (T.D. + B.G.) = Rs. (36 + 1.62) = Rs. 37.62

**(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.

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

$\therefore$ S.I. on Rs. 11 for 2 years is Rs. 1.10

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

**(5) 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

$\therefore$ Required percentage = $\left(\frac{14}{70} \times 100\right)_{\%}$ = 20%.

**(6) 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.

**(7) In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other candidate got, was:**

[A] 2700

[B] 2900

[C] 3000

[D] 3100

**Answer : [A]**

**Explanation:**

Number of valid votes = 80% of 7500 = 6000.

$\therefore$ Valid votes polled by other candidate = 45% of 6000

$$= \left( \frac{45}{100} \times 6000 \right) = 2700.$$

**(8) 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% = $\left( \frac{87500}{175000} \times 100 \right)$% = 50%.

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

**(9) It is being given that $(2^{32} + 1)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?**

[A] $(2^{16} + 1)$

[B] $(2^{16} - 1)$

[C] $(7 \times 2^{23})$

[D] $(2^{96} + 1)$

**Answer : [D]**

**Explanation:**
Let $2^{32} = x$. Then, $(2^{32} + 1) = (x + 1)$.
Let $(x + 1)$ be completely divisible by the natural number N. Then,
$(2^{96} + 1) = [(2^{32})^3 + 1] = (x^3 + 1) = (x + 1)(x^2 - x + 1)$, which is completely divisible by N, since $(x + 1)$ is divisible by N.

**(10) In a division sum, the remainder is 0. As student mistook the divisor by 12 instead of 21 and obtained 35 as quotient. What is the correct quotient ?**

[A] 0

[B] 12

[C] 13

[D] 20

**Answer : [D]**

**Explanation:**
Number = (12 x 35)
Correct Quotient = 420 ? 21 = 20

**(11) A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4, then the respective remainders will be**

[A] 1, 2

[B] 2, 3

[C] 3, 2

[D] 4, 1

**Answer : [B]**

**Explanation:**

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4 | x        y = (5 x 1 + 4) = 9  -------  5 | y -1       x = (4 x y + 1) = (4 x 9 + 1) = 37  --------  | 1 -4   Now, 37 when di
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**(12) 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. $\left[ 5000 \times \left(1 + \dfrac{2}{100}\right)^3 \right]$

$= $ 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

**(13) 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

**(14) The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is:**

[A] 3

[B] 4

[C] 5

[D] 6

**Answer : [B]**

**Explanation:**

$P \left(1 + \dfrac{20}{100}\right)^n > 2P \quad \Rightarrow \quad \left(\dfrac{6}{5}\right)^n > 2.$

Now, $\left(\dfrac{6}{5} \times \dfrac{6}{5} \times \dfrac{6}{5} \times \dfrac{6}{5}\right) > 2.$

So, $n$ = 4 years.

**(15) The difference between compound interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest per annum?**

[A] 8

[B] 10

[C] 12

[D] Cannot be determined

[E] None of these

**Answer : [A]**

**Explanation:**

$\left[15000 \times \left(1 + \dfrac{R}{100}\right)^2 - 15000\right] - \left(\dfrac{15000 \times R \times 2}{100}\right) = 96$

$\Rightarrow 15000 \left[\left(1 + \dfrac{R}{100}\right)^2 - 1 - \dfrac{2R}{100}\right] = 96$

$\Rightarrow 15000 \left[\dfrac{(100 + R)^2 - 10000 - (200 \times R)}{10000}\right] = 96$

$\Rightarrow R^2 = \left(\dfrac{96 \times 2}{3}\right) = 64$

$\Rightarrow$ R = 8.
∵ Rate = 8%.

**(16) A man has Rs. 480 in the denominations of one-rupee notes, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has ?**

[A] 45

[B] 60

[C] 75

[D] 90

**Answer : [D]**

**Explanation:**
Let number of notes of each denomination be $x$.

Then $x + 5x + 10x = 480$
$\Rightarrow 16x = 480$
$\therefore \quad x = 30$.
Hence, total number of notes $= 3x = 90$.

**(17) 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.

**(18) A sum of Rs. 1360 has been divided among A, B and C such that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ of what C gets. B's share is:**

[A] Rs. 120

[B] Rs. 160

[C] Rs. 240

[D] Rs. 300

**Answer : [C]**

**Explanation:**
Let C's share = Rs. $x$
Then, B's share = Rs. $\frac{x}{4}$ ,   A's share = Rs. $\left( \frac{2}{3} \times \frac{x}{4} \right)$ = Rs. $\frac{x}{6}$

$\therefore \quad \frac{x}{6} + \frac{x}{4} + x = 1360$

$\Rightarrow \frac{17x}{12} = 1360$

$\Rightarrow x = \frac{1360 \times 12}{17}$ = Rs. 960

Hence, B's share = Rs. $\left( \frac{960}{4} \right)$ = Rs. 240.

**(19) A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140, then the number of hens will be:**

[A] 22

[B] 23

[C] 24

[D] 26

**Answer : [D]**

**Explanation:**
Let the number of hens be $x$ and the number of cows be $y$.

Then, $x + y = 48$ .... (i)
 and $2x + 4y = 140 \implies x + 2y = 70$ .... (ii)
Solving (i) and (ii) we get: $x = 26$, $y = 22$.
∵ The required answer = 26.

**(20) What is the sum of two consecutive even numbers, the difference of whose squares is 84?**

[A] 34

[B] 38

[C] 42

[D] 46

**Answer : [C]**

**Explanation:**
Let the numbers be $x$ and $x + 2$.
Then, $(x + 2)^2 - x^2 = 84$
$\implies 4x + 4 = 84$
$\implies 4x = 80$
$\implies x = 20$.
∵ The required sum = $x + (x + 2) = 2x + 2 = 42$.