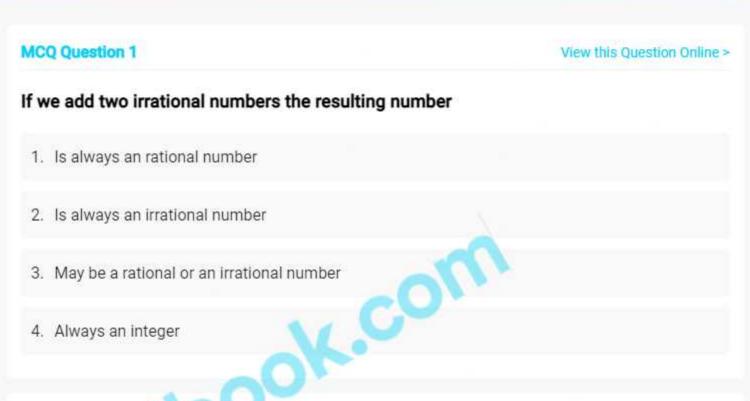
# **Number System Questions**





Answer (Detailed Solution Below)

Option 3: May be a rational or an irrational number



Win over the concepts of Number System and get a step ahead with the preparations for Mathematics with Testbook.

## Number System MCQ Question 1 Detailed Solution

## Concept:

- Rational numbers are those numbers that show the ratio of numbers or the number which we
  get after dividing it with any two integers.
- Irrational numbers are those numbers that we can not represent in the form of simple fractions a/b, and b is not equal to zero.
- · When we add any two rational numbers then their sum will always remain rational.
- But if we add an irrational number with a rational number then the sum will always be an irrational number.

## Explanation:

Case:1 Take two irrational numbers  $\pi$  and  $1 - \pi$ 

 $\Rightarrow$  Sum =  $\pi + 1 - \pi = 1$ 

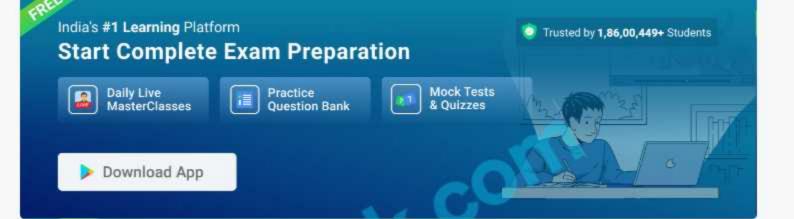
Which is a rational number.

Case:2 Take two irrational numbers π and √2

 $\Rightarrow$  Sum =  $\pi + \sqrt{2}$ 

Which is an irrational number.

Hence, a sum of two irrational numbers may be a rational or an irrational number.



# MCQ Question 2

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## Find the number of factors of 240.

- 1. 20
- 2. 21
- 3. 22
- 4. 23

# Answer (Detailed Solution Below)

Option 1:20

# Number System MCQ Question 2 Detailed Solution

Given:

Factor of = 240

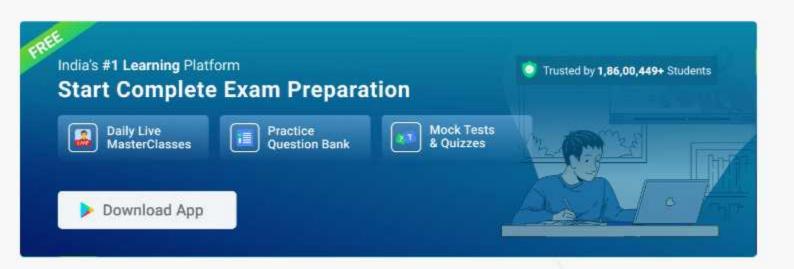
#### Formula used:

N = (a + 1) (b + 1) (c + 1) where X, Y and Z are the prime numbers and a, b and c are their respective powers

## Calculations:

- $\Rightarrow$  240 = 2<sup>4</sup> × 3<sup>1</sup> × 5<sup>1</sup>
- $\Rightarrow$  Number of factors = (4 + 1)(1 + 1)(1 + )
- $\Rightarrow$  Number of factors =  $5 \times 2 \times 2$
- ⇒ Number of factors = 20

Number of factors is 20.



#### MCQ Question 3

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Find the smallest 4 digit number which when divided by 28, 36, 54 gives a remainder of 7 in each case.

1. 1619

2. 1520

3. 1620

4. 1519

# Answer (Detailed Solution Below)

Option 4:1519

# Number System MCQ Question 3 Detailed Solution

#### Given:

The smallest 4 digit number then divide by 28, 36, 54 gives a remainder as 7.

#### Calculation:

LCM of (28,36,54) + 7 will be the number that we have to find

LCM of (28,36,54) will be

 $28 = 4 \times 7$ 

$$36 = 4 \times 9$$

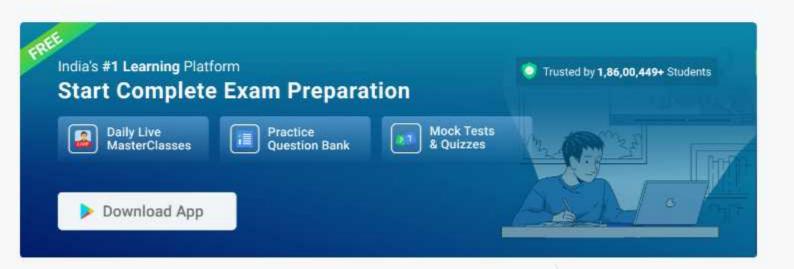
$$54 = 6 \times 9$$

LCM will be =  $9 \times 4 \times 3 \times 7 = 756$ 

But we have to find the smallest 4 digit number

$$\Rightarrow$$
 756 × 2 = 1512 + 7

.: The smallest number is 1519.



## MCQ Question 4

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# The decimal number 1.23657657657657 ...... is equal to the rational number

- 1. 123/99
- 2. 1235/9990
- 3. 123657/100000
- 4. 123534/99900

## Answer (Detailed Solution Below)

Option 4: 123534/99900

## Number System MCQ Question 4 Detailed Solution

## CONCEPT:

For any popterminating decimal value having a digite repeating to change it into a rational number

ror any nonterminating declinar value having x digits repeating to change it into a rational number,

we have to multiply that number with  $^{10^x}$  and again subtract the given number from it.

## CALCULATION:

Let x = 1.23657657657657

 $\therefore$  It can be written as x=1.23657 —(A)

This number has three repeating numbers so we will multiply 102 in equation (A)

So 
$$100x = 123.657$$
 (1)

Again Multiply 105 in equation (A)

$$\Rightarrow$$
 100000 $x = 123657.657$  ...(2)

Subtract equation 1 from equation 2

$$\therefore x = \frac{123534}{99900}$$



## MCQ Question 5

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There is a digit at the 10th place of 6n, in which n is a natural number that is greater than 1, it can be:

- 1. 1, 2, 3, 4, 5
- 2. 1, 3, 5, 7, 9
- 3. 1, 2, 6, 8, 9
- 4. 1, 3, 5, 8, 9

# Answer (Detailed Solution Below)

Option 1:1, 2, 3, 4, 5

# Number System MCQ Question 5 Detailed Solution

#### Given:

There is a digit at the 10th place of 6n.

esiloookaa Where n is a natural number that is greater than 1.

#### Calculation:

Let be n= 2, 3, 4, 5,...

$$\Rightarrow$$
 6 × 2 = 12 = 1

$$\Rightarrow 6 \times 3 = 18 = 1$$

$$\Rightarrow$$
 6 × 4 = 24 = 2

$$\Rightarrow$$
 6 × 5 = 30 = 3

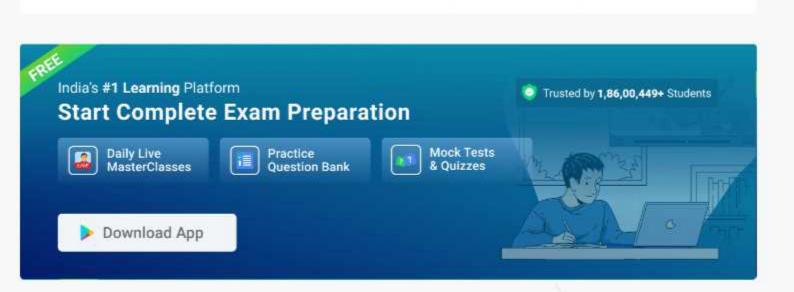
$$\Rightarrow$$
 6 × 6 = 36 = 3

$$\Rightarrow$$
 6 × 7 = 42 = 4

$$\Rightarrow 6 \times 8 = 48 = 4$$

$$\Rightarrow 6 \times 9 = 54 = 5$$

.. It can be 1, 2, 3, 4, 5.



## MCO Question 6

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What is the sum of digits of the least number which when divided by 21, 28, 30 and 35 leaves the same remainder 10 in each case but is divisible by 17?

- 1. 11
- 2. 13
- 3. 14
- 4. 10

## Answer (Detailed Solution Below)

Option 2:13

# Number System MCQ Question 6 Detailed Solution

#### Given:-

Least number when divided by 21, 28, 30, and 35 leaves 10 as a remainder in each case

## Concept

When a number divides by certain numbers and leaves same remainder in each case then their LCM also divisibly by that number

#### CALCULATION:-

On Taking L.C.M of 21, 28, 30, and 35 = 420

Least number 420k + 10 is divisible by 17 = 420 × 2 + 10 = 850

Least number which when divided by 21, 28, 30, and 35 leaves 10

as a remainder in each case but divisible by 17 = 850

:Sum of digits of this least number = 8 + 5 + 0 = 13









# MCQ Question 7

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# Find the value of 9996 × 10004

- 1. 99999984
- 2. 99999804
- 3. 99999914
- 4. 99999964

# Answer (Detailed Solution Below)

Option 1:99999984

# Number System MCQ Question 7 Detailed Solution

# Concept Used:

In this type of question, the value of a given product can be easily calculated by using the formula given below

#### Formula Used:

 $(a + b) \times (a - b) = (a^2 - b^2)$ , where 'a' and 'b' are real number.

#### Calculation:

The given expression is 9996 × 10004.

Using the above formulae, we have a = 1000; b = 4

$$\Rightarrow$$
 (10000<sup>2</sup> - 4<sup>2</sup>)

⇒ 99999984



# MCQ Question 8 If a real number 1.18181818.... is expressed as a/b, then a - b is 1. 1 2. 2 3. 3 4. 4

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# Answer (Detailed Solution Below)

Option 2:2

# Number System MCQ Question 8 Detailed Solution

#### Calculation:

Given real number is 1.181818....

Let x = 1.18181818..... as two digits are repeating, lets multiply x by 100,

⇒ 100x = 118.181818....

⇒ 100x - x = 118.181818... 181818...

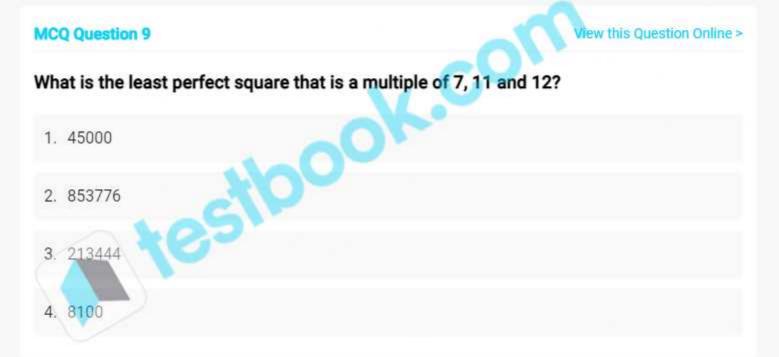
 $\Rightarrow$  99x = 117

 $\Rightarrow$  x = 13/11

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⇒a=13,0=1 ⇒a-b=2





Answer (Detailed Solution Below)

Option 3: 213444

# Number System MCQ Question 9 Detailed Solution

#### Given:

The numbers = 7, 11, 12

## Concept:

LCM = The LCM of the numbers is the smallest number that is the multiple of every one of the numbers

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#### Calculation:

Let us assume the least perfect square be X

$$\Rightarrow 7 = 7 \times 1$$

$$\Rightarrow$$
 11 = 11 × 1

$$\Rightarrow$$
 12 =  $2^2 \times 3$ 

- $\Rightarrow$  The LCM of (7, 11, 12) =  $2^2 \times 3 \times 11 \times 7$
- $\Rightarrow$  The least perfect square =  $2^2 \times 3^2 \times 11^2 \times 7^2 = 213444$
- .. The required result will be 213444.



#### MCQ Question 10

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If the three numbers are added in pairs, the sum is equal to 10, 16, 24. What is the difference b/w third and first number?

1. 9

2. 6

3. 5

4. 4

# Answer (Detailed Solution Below)

Option 2:6

# Number System MCQ Question 10 Detailed Solution

## Given:

Sum s are = 10, 16, and 24

## Calculation:

Let, the numbers are a, b and c

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According to the question,

$$\Rightarrow$$
 a + b = 10

$$\Rightarrow$$
 b + c = 16

$$\Rightarrow$$
 c + a = 24

From above question,

$$\Rightarrow$$
 2(a + b + c) = 50

$$\Rightarrow$$
 (a + b + c) = 25

Value of 
$$a = 25 - (b + c) = 25 - 16 = 9$$

Value of 
$$c = 25 - (a + b) = 25 - 10 = 15$$

Required difference = 
$$(15 - 9) = 6$$

#### .: Difference is 6