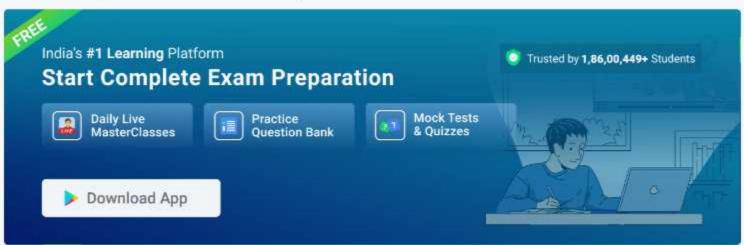
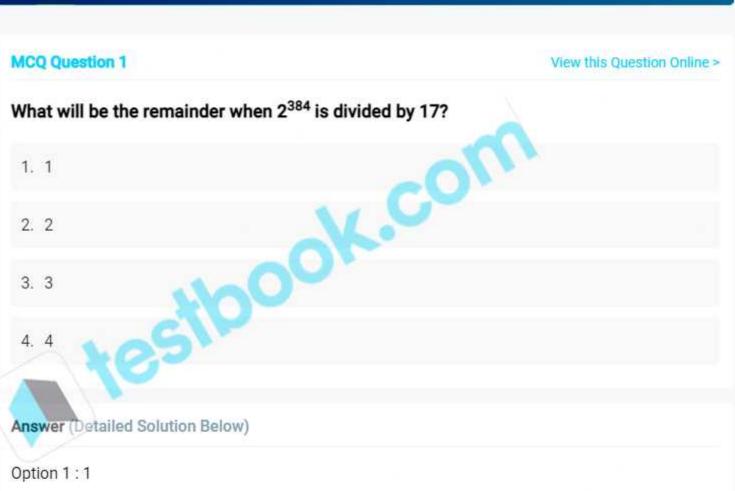
# **Divisibility and Remainder Questions**







### Divisibility and Remainder MCQ Question 1 Detailed Solution

### GIVEN:

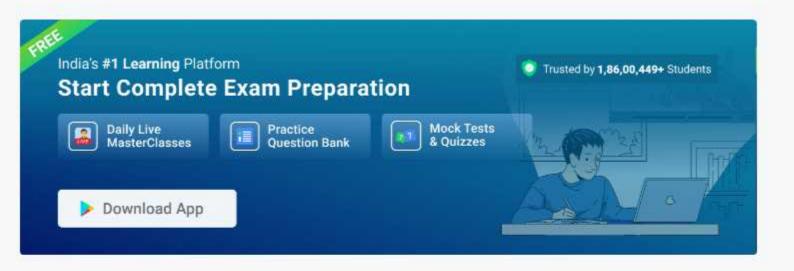
2384 is divided by 17.

### CALCULATION:

 $2^{384} = 2^{(4 \times 96)} = 16^{96}$ 

We know that when 16 is divided by 17 the remainder is -1

When  $16^{96}$  is divided by 17 then remainder =  $(-1)^{96}$  = 1.



# MCQ Question 2 What will be the remainder if 2<sup>89</sup> is divided by 9?

- 1. 2
- 2. 3

3. 4

### Answer (Detailed Solution Below)

Option 4:5

### Divisibility and Remainder MCQ Question 2 Detailed Solution

### GIVEN:

289 is divided by 9.

### CONCEPT:

If we divide 8 by 9 we will get the remainder as - 1

But remainder can not be negative

Therefore we can not use -1 as the remainder

uder To simplify calculation, we use 9 - 1 = 8 as a remainder

### CALCULATION:

 $(2^{89}/9)$ 

$$\Rightarrow \{(2^3)^{29} \times 2^2\}/9$$

$$\Rightarrow \{(8)^{29} \times 4\}/9$$

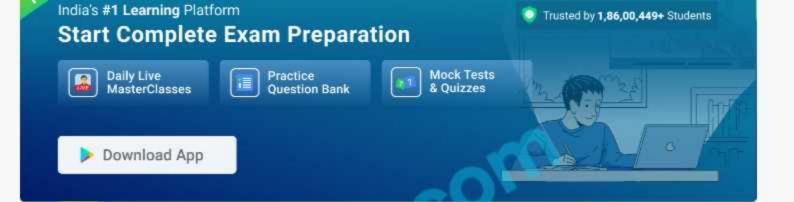
$$\Rightarrow \{(-1)^{29} \times 4\}/9$$

$$\Rightarrow (-1 \times 4)/9$$

$$\Rightarrow -4/9$$

$$\Rightarrow$$
 Remainder = -4 + 9 = 5

:. The remainder if 289 is divided by 9 is 5.



### MCQ Question 3

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If the 5-digit number 676xy is divisible by 3, 7 and 11, then what is the value of (3x - 5y)?

1.

11

3. 10

4. 7

### Answer (Detailed Solution Below)

Option 1:9

### Divisibility and Remainder MCQ Question 3 Detailed Solution

When 676xy is divisible by 3, 7 &11, it will also be divisible by the LCM of 3, 7 &11.

Dividend = Divisor × Quotient + Remainder

Calculation:

LCM(3, 7, 11) = 231

By taking the largest 5-digit number 67699 and divide it by 231.

:: 67699 = 231 × 293 + 16

⇒ 67699 = 67683 + 16

 $\Rightarrow$  67699 - 16 = 67683 (completely divisible by 231)

 $\therefore$  67683 = 676xy (where x = 8, y = 3)

 $(3x - 5y) = 3 \times 8 - 5 \times 3$ 

 $\Rightarrow$  24 - 15 = 9

.. The required result = 9



### MCQ Question 4

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How many whole numbers are there between 244 and 332 which are exactly divisible by 7?

1. 15

2. 23

3. 8

4. 13

### Answer (Detailed Solution Below)

Option 4:13

### Divisibility and Remainder MCQ Question 4 Detailed Solution

Numbers that are divisible by 7 between 244 and 332,

⇒ 245, 252.....329

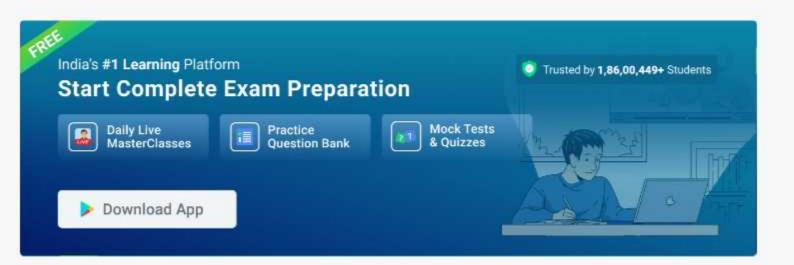
Using AP:

$$a_n = a + (n - 1)d$$

$$329 = 245 + (n-1) \times 7$$

$$n = 13$$

.. There are 13 numbers



### MCQ Question 5

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If a number 5x423y is completely divisible by 88 then find the value of 5x - 8y.

1. 16

2. 24

3. 32

4. 40

### Answer (Detailed Solution Below)

Option 2:24

### Divisibility and Remainder MCQ Question 5 Detailed Solution

### Given

If a number 5x423y is completely divisible by 88

### Concept used

Divisibility rule of 8 = Last three digit of any number should be divisible by 8, then number is divisible by 8

Divisibility Rule of 88 = Number should be divisible by both 8 and 11.

Divisibility Rule of 11 = Sum of odd place digit - Sum of even digit place = 0 or multiple of 11

### Calculation

If a number 5x423y is completely divisible by 88

So, By using divisibility rule of 8

y = 2 because 232 is divisible by 8

Now, By using divisibility rule of 11

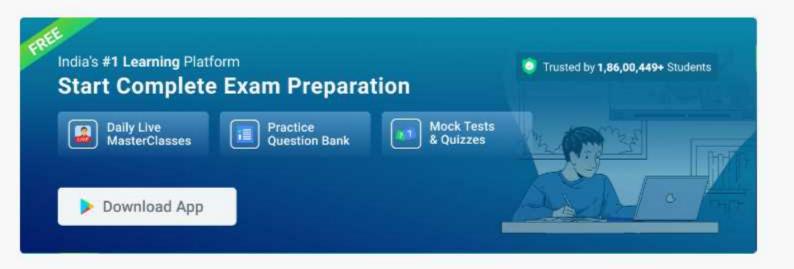
$$\Rightarrow$$
 (x + 2 + 2) - (5+4+3) = 0

$$\Rightarrow$$
 (x + 4) - (12) = 0

$$\Rightarrow x = 8$$

The value of 5x - 8y = 40 - 16 = 24

.. The required answer is 24



### MCQ Question 6

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When a number is divided by 7 it gives 3 as remainder. Find the total possible numbers between 1 to 100.

1. 10

2. 14

2 10

### Answer (Detailed Solution Below)

Option 2:14

### Divisibility and Remainder MCQ Question 6 Detailed Solution

### Given:

When a number is divided by 7 it gives 3 as the remainder.

### Formula used:

esilookka  $I = a + (n - 1) \times d$ (where I, a, n and d are last term, first term, number of terms and common difference respectively)

### Calculations:

Required number = 7x + 3

Putting x = 0, 1, 2, ..., 13, we get 3, 10, 17......94.

The required series is 3, 10, 17......94

$$\Rightarrow$$
 a = 3, d = 7 and I = 94

$$I = a + (n - 1) \times d$$

$$\Rightarrow$$
 94 = 3 + (n - 1) × 7

$$\Rightarrow$$
 n = 14

### .. The total possible numbers satisfying the given conditions are 14



### Mistake Point

The first number will be 3 because when we multiply 7 by 0 and add 3, then the value will be  $7 \times 0 +$ 3 = 3

The numbers are = 3, 10, 17, 24, 31, 38, 45, 52, 59, 66, 73, 80, 87 and 94

Total number of numbers = 14









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### MCQ Question 7

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What is the product of the largest and the smallest possible values of m for which a number 5m83m4m1 is divisible by 9?

- 1. 16
- 2. 40
- 3. 80
- 4. 10

### Answer (Detailed Solution Below)

Option 1:16

### Divisibility and Remainder MCQ Question 7 Detailed Solution

### Concept:

Divisibility rule of 9: A number is divisible by 9, when the sum of the digits of the number is divisible -. + 3m

⇒ Minimum value of m = 2 (as 27 is the multiple of 9)

For maximum value

⇒ 21 + 3m (as 45 is the multiple)

⇒ Maximum v-1 by 9.

- .. The product of largest and smallest value



Here m is a digit (m can be 0, 1, 2, 3,....,8) not other than this.

We can't take m = 20, m = 30 etc.



### MCQ Question 8

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What will be remainder when we divide  $(x^{71} + 71)$  by (x + 1)?

1. 71

2. 70

3. 0

4. 1

## Answer (Detailed Solution Below)

Option 2:70

# ook.com Divisibility and Remainder MCQ Question 8 Detailed Solution

Given:

$$(x^{71} + 71) \div (x + 1)$$

Calculation:

$$x + 1 = 0$$

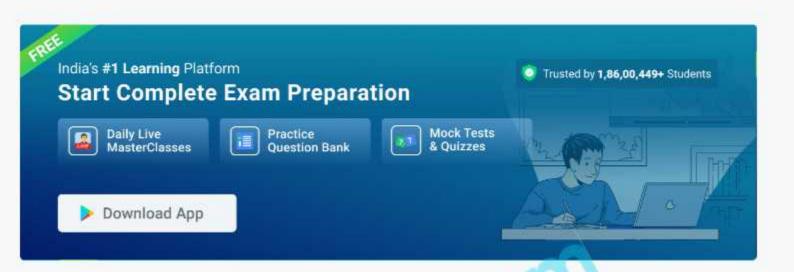
$$\Rightarrow x = (-1)$$

Put 
$$x = (-1)$$
 in  $(x^{71} + 71)$ 

$$\Rightarrow (-1)^{71} + 71$$

$$\Rightarrow -1 + 71$$

.: Required remainder is 70.



### MCQ Question 9

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# If P713 is divisible by 11, find the value of the smallest natural number P?

1. 5

2. 6

3. 7

4 0

### Answer (Detailed Solution Below)

Option 4:9

# Divisibility and Remainder MCQ Question 9 Detailed Solution

Given:

If P713 is divisible by 11

### Concept used:

The divisibility rule of 11 is that you must subtract and then add the digits in an alternating pattern from left to right. If your answer is 0 or 11 then it is divisible by 11.

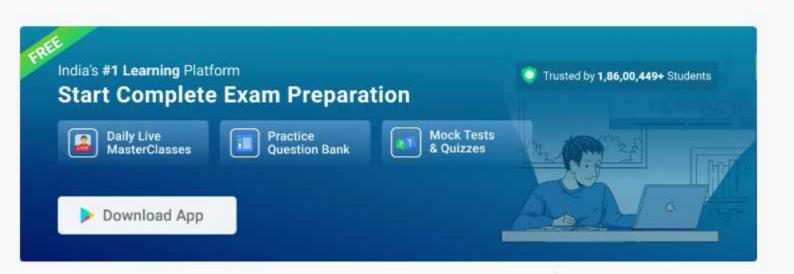
### Calculation:

Hence, we can see,

if we put P = 9

$$(9+1) - (7+3) = 10 - 10 = 0$$

.. The value of the smallest natural number P is 9.



# MCQ Question 10 If a five digit number 247xy is divisible by 3, 7 and 11, then what is the value of (2y - 8x)? 1. 9 2. 17 3. 6 4. 11

### Answer (Detailed Solution Below)

Option 3:6

### Given:

If a five digit number 247xy is divisible by 3, 7 and 11

### Calculation:

LCM of 3, 7, 11 is 231

According to question

Largest possible value of 247xy is 24799

OOK.COM when we divided 24799 by 231 we get 82 as a remainder

Now 
$$x = 1$$
 and  $y = 7$ 

$$(2y - 8x) = (2 \times 7 - 8 \times 1)$$

$$\Rightarrow (14 - 8)$$

### .: Required value is 6