## **Operation On Numbers**

### Introduction

In the previous chapter, we have studied about numbers, way of numeration and some properties of numbers. In this chapter we will study about operation on numbers. Addition, subtraction, multiplication and division are four basic arithmetic operations. Let us know about them.

#### $\langle \rangle$

#### Addition

Under the operation of addition two or more than two numbers are added with each other. Addends: The numbers that are added together are called addends. Sum: The result we get after addition is called sum.



#### Add 2134 and 3425 Solution:

Thausands Hundreds Tens Ones

2	1	3	4	First addend
+3	4	2	5	Second addend
5	5	5	9	Sum

#### How to Perform Addition

Arrange the digits of the numbers that are to be added column wise in the place value chart such that digits at the unit place in the numbers come in the units column digits at the tens place come in the tens column and so on. Now add ones to ones, tens to tens and so on.

#### Illustrative EXAMPLE

#### Find the sum of 46898 and 2564

Ten thousands	Thousands	Hundreds	Tens	Ones
4	6	8	9	8
+	2	5	6	4
4	9	4	6	2

#### Word Problems Based on Addition

Illustrative EXAMPLE

Population of a small town was 45789856 in the year 2009, In 2010, 214500 more people come in the town from outside and settled. Find the population of the city in 2010.

Solutions:

Population of the city in 2009 = 45789856

Number of people who come into the town = 214500

Therefore, population of the city in 2010 = 45789856 + 214500 = 46004356

> A factory produces 894500 cars, 789600 bikes, and 456800 scooty in a year. How many vehicles did it produce in a year?

#### Solution:

Number of car =894500 Number of bike = 789600 Number of scooty = 456800 Total number of vehicles = 894500 + 789600 + 456800 = 2140900.

#### **Subtraction**

Subtraction: Under the operation of subtraction, difference between two numbers is found. Minuend: The number from which other number is subtracted is called minuend. Subtrahend: The number which is subtracted from a number is called subtrahend. Difference: The result we get after subtraction is called difference.

#### Illustrative

EXAMPLE

Subtract 1254 from 7889				
Hundreds	Tens	Ones		
8	8	9	Minuend	
2	5	4	Subtrahend	
6	3	5	Difference	
	Hundreds 8	Hundreds Tens 8 8	Hundreds Tens Ones 8 8 9	

#### **How to Perform Subtraction**

Just like addition digits of both minuend and subtrahend are arranged in the place value chart. Digits of the subtrahend comes below to the digits of minuend. Now subtract ones from ones, tens from tens and so on.

#### Illustrative

**EXAMPLE** 

#### Find the difference between 4568 and 2795

Solution:

Thousands	Hundreds	Tens	Ones
4	5	6	8
-2	7	9	5
1	7	7	3

#### **Word Problem Based on Subtraction**

Illustrative EXAMPLE

A person earns ₹ 36000 per month. He spends ₹ 1500 on education, ₹ 3600 on house rent, and ₹ 7500 on fooding and he saves the rest of money. Find his saving in a month.

(a) <b>₹</b> 23400	(b)₹ 90000
(c) <b>₹</b> 23600	(d) <b>₹</b> 12600
(e) None of these	
Answer: (a)	
Explanation	
His total income in a month	=₹36000
His total expenditure in a m	onth = ₹ 1500 + ₹ 3600 + ₹ 7500
=₹12600	
Therefore, his saving in a m	onth = ₹ 36000 - ₹ 12600
=₹23400	

## Illustrative

EXAMPLE

A book contains 1256 pages. 256 pages are blue, 186 pages are green and rest of the pages are white. Find the difference between the numbers of white pages and blue pages:

(a) 814 (b) 1000
(c) 628 (d) 558
(e) None of these
Answer: (d)
Explanation
Total number of pages in the book = 1256
Total number of blue and green pages = 256 + 186 = 442
Therefore, total number of white pages = 1256 - 442 = 814
Difference between the numbers of white and blue pages = 814 - 256 = 558

## Multiplication

When a number is added to itself number of times, the process of addition becomes bigger and lengthy, therefore, a short cut method of addition was developed to perform such additions called multiplication. Thus multiplication is a short cut method of repeated addition.

#### Illustrative EXAMPLE



6035 + 6035 + 6035 + ...168 times. It is a tedious job to solve it. So a simple method is used to solve such questions. We can solve the above problem simply as  $6035 \times 168 = 1013880$ Multiplicand: The number which is multiplied is called multiplicand.

**Multiplier:** The number by which other number is multiplied is called multiplier. **Product:** The result is called product.

#### Illustrative EXAMPLE

## Multiply 46898 and 64 Solution:

#### How to Perform Multiplication

#### Multiply 890456 by 983

**Step 1:** Multiply 890456 by 3 (because 3 is at the unit place in the multiplier 983)  $890456 \times 3 = 2671368$ **Step 2:** Now multiply 890456 by 80 (because 8 is at the tens place in the multiplier 983)890456  $\times 80 = 71236480$ 

**Step 3:** Now multiply 890456 by 900 (because 9 is at the hundreds place in the multiplier  $983)890456 \times 900 = 801410400 - 1$ 

**Step** 4: Now add all the above results 2671368 + 71236480 + 801410400 = 875318248 Thus 890456×983 = 875318248 It can be written as

#### 



Word Problems Based on Multiplication

#### Illustrative EXAMPLE

There are 225 godowns. Each godowns has 5478 rice bags and each bag contains 20 kg of rice. Find the total amount of rice.

- (a) 24651000kg (k (c) 546890 kg (c (e) None of these
- (b) 6523600kg (d) 1205630 kg

#### Answer: (a)

#### Explanation

There are 225 godowns and each godowns contains 5478 rice bags. Therefore, total number of rice bags =  $225 \times 5478 = 1232550$  One bag contains 20 kg of rice, so total amount of rice =  $1232550 \times 20 = 24651000$ kg

#### Illustrative EXAMPLE

There are 15 rows of trees in a garden. Each rows has 245 trees. Trees of 4 rows are cut down. Find the total number of remaining trees in the park.

(a) 3675	(b) 980
(c) 4655	(d) 2695
(e) None of these	

#### Answer: (d)

**Explanation** There are 15 rows of trees in the garden and each rows has 245 trees Therefore, total number of trees in the garden =  $15 \times 245 = 3675$ Total number of trees which was cut down =  $245 \times 4 = 980$ Remaining number of trees = 3675 - 980 = 2695.

#### Oivision

**Division:** distribution of a quantity into some parts such that each of the parts contains equal amount is called division.

Dividend: The number which is divided.

**Divisor:** The number by which other number is divided.

Quotient: Number of times by which the divisor is multiplied to get equal to dividend.

Remainder: The number which is left after subtraction

Illustrative EXAMPLE	
EXAMPLE	

Divide 4575 by 20. Dividend  $\uparrow$ Divisor  $\leftarrow 20$ )4575(228 $\rightarrow$ Quotient  $\frac{-40}{057}$   $\frac{-40}{175}$  $\frac{-160}{015} \rightarrow$  Remainder



Divide 25689 by 23 and find remainder. 23)25689(1116 <u>-23</u> 026 <u>-23</u> 038 <u>-23</u> 159 <u>-138</u> 021

#### How to Perform Division

Consider first digit of the dividend from left.

**Condition 1:** When the first digit is greater than or equal to the divisor:

**Step 1:** Multiply the divisor by a number such that the product is closest to the number but not greater.

Step 2: Write the multiplier in the quotient side and the product below the number and subtract.

**Step 3:** Bring down the second digit of the dividend and write it right to the difference.

**Step 4:** Now compare the formed number with the divisor. If the number is greater than divisor, follow the above steps. If the number is smaller than the divisor multiply the divisor by 0 and follow above steps. Continue the process till all the digits of the dividend is brought down.

Condition 2: When the first digit is smaller than the divisor,

Step 1: Multiply the divisor by 0 and follow the above steps.

**Note:** If the number formed by first two digits of the dividend is also smaller than divisor, multiply the divisor by 0 and follow the above steps.

#### Word Problems Based on Division

#### **Illustrative** EXAMPLE

Arwin types 66 words in a minute, the average number of letter in a word is 6. If he types for 10 hours, how many times can he type the word "mathematics"?

- (a) 21600 times
- (b) 19200 times
- (c) 15200 times
- (d) 25200 times
- (e) None of these

#### Answer: (a)

#### Explanation

Arwin types 66 words in a minute and the average number of letter in a word is 6

Therefore, total number of letters he types in a minute  $= 66 \times 6 = 396$ Thus, in 10 hours he can type  $= 396 \times 60 \times 10$  letters = 237600 letters

The word "mathematics" contains 11 letters. Therefore, total number of times he can type the word 237600

"mathematics"  $=\frac{237600}{11}=21600.$ 

#### Illustrative EXAMPLE



There are 72575 mangoes. They are to be packed into boxes. If each box contains 25 mangoes, find the number of required boxes.

(a) 2225

(b) 3000

(c) 2903

(d) 7125

(e) None of these

Answer: (c)

**Explanation** Total number of mangoes = 72575 Number of mangoes in one box = 25

Therefore, total number of boxes  $=\frac{72575}{25}=2903$ 



- Addition, subtraction and multiplication always starts from right and gees to left.
- When we add 1 to n digit highest number we get n+1 digit smallest number (n is a natural number).
- Product of two numbers is an add number.
- Product of two even numbers is an even number.
- Product of a add number and an even number is an even number.





- Addition is the sum numbers.
- When any number is added by 6, the number does net get change.
- Subtraction is the difference of two numbers.
- When 8 is subtracted from a number, the number remains same.
- Multiplication is the short cut method of repeated addition.
- When a number is multiplied by B, the number gets 8.
- When a number is multiplied by 1, the number does net get changed.
- Division is the method ff distribution if a quantity into some equal parts.
- When a number is divided by 1, the number does not get changed.

# Commonly Asked



Find the sum of A, B, and C when A = 96545 B = 225, and C = 1002? (a) 97770 (b) 97772 (c) 77792 (d) 47772

Answer: (b)

(e) None of these

#### Explanation

A + B + C = 96545 + 225 + 1002 = 97772.



In a school, number of boys is 645 more than that of girls. If there are 2563 girls in the school, find the total number of students in the school?

(a) 5771- (b) 3208 (c) 4568 (d) 4786 (e) None of these

#### Answer: (a)

#### Explanation

Number of girls in the school = 2563 Number of boys in the school = 2563 + 645 = 3208 Total number of students in the school = 2563 + 3208 = 5771.



There are two sets of question paper. Set A contains 25 objective questions and 60 subjective questions. Set B contains 35 objective question and 50 subjective question.

Jack: Both the sets of question paper has contained equal number of questions. **Codi:** Total number of subjective questions is equal to the total number of objective questions. Who is correct? (a) Jack (b) Codi

- (c) Both are correct
- (d) Both are partially incorrect
- (e) None of these
- Answer: (a)



#### 6 8 2 0 6 4 8 8 6 2 4

Look the above sum carefully and find in which one of the following columns from right there is a mistake?

(a) First (c) Third (e) None of these

98

(b) Second (d) Fourth

Answer: (c)



Subtract 5896 from the difference between 98456 and 2999 (a) 45897 (b) 48796 (c) 89561 (d) 48963 (e) None of these

Answer: (c) Explanation Difference between 98456 and 2999 = 98456 - 2999 = 95457 Now subtract 5896 from 95457 Thus 95457-5896=89561



If B = 456, find the value of A in the equation A - 2B = 3B (a) 912 (b) 1368 (c) 456 (d) 2280

(e) None of these

Answer: (d) Explanation Given B = 456, Therefore,  $2B = 2 \times 456 = 912$ , and  $3B = 3 \times 456 = 1368$ Now put the value of 2B and 3B in the equation Thus A - 912 = 1368, A = 912 + 1368 A =2280



- If A B = 255, B C = 275, C D = 250 then find A D
- (a) 840
- (c) 260

(e) None of these





(b) 780

(d) 275

- (a) When a number is subtracted from two times of itself result is the number itself
- (b) When a number is subtracted from the least whole number, the result is not a whole number

(c) When two negative integers, are subtracted from each other the result may be positive or negative integer

(d) Subtraction is the method by which difference between two numbers is found

(e) None of these

#### Answer: (b)

A question paper contains 30 questions. Questions from 1 to 17 are of 4 marks each and questions from 18 to 30 are of 5 marks each. Jack solves Q1, Q2, Q5, Q6, Q15, Q18, Q27 and 0, 30 whereas Codi solves all the questions. Find the difference between marks of Codi and Jack.

(a) 133	(b) 98
(c) 90	(d) 100
(e) None of these	

#### Answer: (b)



Which one of the following is the product of 2795 and 630?

(a) 2754602	(b) 1760850
(c) 2457860	(d) 2546380
(e) None of these	

Answer: (b) Explanation  $2795 \times 630 = 1760850$ 

Arwin types 40 words in a minute. He types 8 hours in a day. How many words would he type if he works from Monday to Saturday? (a) 19200 words (b) 91200 words (c) 115200 words

- (d) 95200
- (e) None of these

Answer: (c)

John has a collection of 150 maths book. Each book has 225 number of pages. If each of the page contains 5 questions and John takes 3 minutes to solve one question, how much time does John take to solve all the questions contained by 100 such books?

Answer: (a)		
(e) None of these		
(c) 520 hours		
(a) 625 hours		

(b) 525 hours (d) 775 hours

There are 75 bulbs in a house. Each bulb consumes 60 joule energy each second. 50 bulbs was replaced by 50 power saver. If one power saver consumes 10 joule energy in a second, find the total amount of energy now save in a day(I kilo joule = 1000 joule).

(a) 388800 kilo joule	(b) 43200 kilo joule
.,	.,
(c) 129600 kilo joule	(d) 216000 kilo joule
(e) None of these	
Answer: (d)	



#### Divide 45648 by 24 and find the quotient.

Answer: (b)	
(e) None of these	
(c) 1901	(d) 1900
(a) 190	(b) 1902

**Explanation** 24)45648(1902

 $\frac{-24}{216}$   $\frac{-216}{00048}$   $\frac{-48}{00}$ Quotient = 1902



An ant is climbing on a pole. If height of the pole is 700 m and the ant cover 5 cm in 1 second, find the time taken by the ant to reach on the top of the pole.

- (a) 4 hour 30 minute (c) 3 hour 23 minute
- (b) 4 hour 53 minute (d) 5 hour 53 minute
- (e) None of these

Answer: (a) Explanation Height of the pole  $= 700 \times 100 cm = 70000 cm$ 

Total time taken by the ant to reach on the top of the pole  $=\frac{70000}{5}=14000$  second

When A is divided by 42, the remainder is 33. If A = 414615, find the quotient. (a) 9870 (b) 9874 (c) 9872 (d) 9873 (e) None of these Answer: (b) When X is divided by Y, the quotient and remainder are Z and R respectively. Which one of the following is not true? (a) If Z is two times of Y then R < Y (b)  $Y \times (Z+1) > X$ (c)  $X + R = Y \times Z + 2R$ (d)  $2Z \times 2Y = 2Z$ (e) None of these Answer: (d) Zack wants to multiply two numbers such that their product is 4083936. For this, he selects first number 456 and other number 7896. He finds the product is not same as he wants. Therefore, he replaces 7896 by one of the following numbers. Choose which one is this? (a) 8056 (b) 8956 (d) 5796 (c) 5896 (e) None of these Answer: (b) If A = 2510, B = 2650 and C = 2512, which one of the following is greatest? (a)  $A \times B$ (b)  $B \times C$ (c)  $A \times C$ (d)  $A \times A$ (e) None of these Answer: (b) Find the sum of 25486 and 3562. (a) 28056 (b) 28956 (c) 25896 (d) 29048 (e) None of these Answer: (d)

# Self Evaluation



1.	In an election, 56475 people cast their votes for one seat and 46785 people for another seat and 87654 for the third east. How means a set of the set three seates?											
	the third seat. How many people cast votes for these three seats?											
	(a) 190924	(b) 190814 (d) 190914										
	(c) 191924	(d) 190914										
	(e) None of these											
2.	A + A + A + A + A + A + B + B + B + B = 78731156. If B is twice of A find the value of 2 (A + B)											
	(a) 33741974	(b) 43741924										
	(c) 33741924	(d) 33741024										
	(e) None of these											
3.	What number should be added to 275 so that sum becomes twice of 815?											
	(a) 1225	(b) 1345										
	(c) 1355	(d) 1145										
	(e) None of these	(0) 1145										
4.	10368 oranges are packed equally in 108 boxes. Find the number of oranges each box contains.											
	(a) 94	(b) 96										
	(c) 98	(d) 100										
	(e) None of these											
5.	In a godown, there are 4562 rice bags and 3085 wheat bags. Each rice bag contains 25 kg rice and each wheat bag contains 30 kg wheat. Find the total amount of grain in the godown.											
	(a) 114050 kg	(b) 92550 kg										
	(c) 206600kg	(d) 7853000 kg										
	(e) None of these											
-												
6.		25468 people are below 20, age of 45986 people are between 20 and 30, and age of ove 30. If total population of the village is 100000. Find the number of people who										
6.	remaining people is abo											
6.	remaining people is abo are above 30.											
6.	remaining people is abo are above 30. (a) 28546											
6.	remaining people is abo are above 30. (a) 28546 (b) 71454											

A car goes 256 km in 1 hour whereas a bike goes 274 km in 1 hour. Both starts running simultaneously on 7. the same path and in the same direction, after 5 hour, what will be the distance between the car and the bike? (a) 60km (b) 70km (d) 90km (c) 80km (e) None of these 8. P, Q, and R are natural numbers and P = 45620 and Q = 6235. If sum of P and Q is equal to the difference of R and Q. Which one of the following is the possible value of R? (a) 42536 (b) 30085 (c) 75462 (d) 58090 (e) None of these 9. In a garden, there are 45623 flower plants in each row and there are 2560 rows in the garden. Find the total number of flower plants in the garden. (a) 116794880 (b) 118794880 (c) 116794888 (d) 116798880 (e) None of these 10. A, B, and C are natural numbers. A is twice of B and B is thrice of C. If B = 10125, find the value of A + B + C. (a) 32750 (b) 33750 (c) 34750 (d) 35750 (e) None of these

	Answers – Self Evaluation Test																	
1.	D	2.	С	3.	С	4.	В	5.	С	6.	А	7.	D	8.	D	9.	А	<b>10.</b> B

# Self Evaluation Test SOLUTIONS

- **1.** Total number of people who cast the vote for these three seats =56475+46785+87654=190914
- 4. Total number of oranges = 10368 Number of boxes = 108 10368 Therefore/number of oranges in a box  $=\frac{10368}{108}=96$
- 5. Total amount of rice =  $4562 \times 25 \ kg = 114050 \ kg$ Total amount of wheat =  $3085 \times 30 \ kg = 92550 \ kg$ Total amount of grain = 114050 kg + 92550 kg = 206600 kg
- Number of peoples whose age is below 20= 25468
   Number of peoples whose age is between 20 and 30 = 45986 Number of peoples whose age is up to or less than 30 = 25468 + 45986 = 71454
   Number of peoples whose age is more than 30 = 10000 71454 = 28546
- Distance covered' by the car in 5 hour = 1280 km
   Distance covered by the bike in 5 hour = 1370 km
   Distance between the bike and the car = 1370 km 1280 km = 90 km
   Therefore, option (D) is correct and rest of the options is incorrect
- According to the question P+Q=R - Q
   45620 + 6235 = R - 6235
   45620 + 6235 + 6235 = R
   R=58090

9. Number of flower plants in 1 row =45623
 Number of rows in the garden =2560
 Thus, total number of flower plants in the garden = 45623×2560=116794880

**10.** According to the question, B is thrice of C and B = 10125 Therefore,  $C = \frac{10125}{3} = 3375$ A is twice of B Therefore,  $A = 10125 \times 2 = 20250$ Thus, A + B + C = 20250 + 10125 + 3375 = 33750