# **MATHEMATICAL OPERATIONS**

# **Learning Objectives**

- Introduction
- Case I st
- Case 2 nd

# Introduction

In this section; question pattern is based on basic fursdamentals of simple mathematical operations, it is divided into four types. Problems In this type of reasoning questions may be on the symbols used in basic mathematical operations, such as:

Addition:	(+)
Subtraction:	(—)
Multiplication:	(×)
Division:	(÷)

Also (>, <, =) 'greater than' less than' and 'equal to etc.

# Case -1st

Basic BODMAS rule is applied to solve simple mathematical operations.

- B = Brackets [firstly solve big bracket, middle and small
- O = Of
- D = Division
- M = Multiplication
- A = Addition
- S = Subtraction

Note: This chapter will also help the students to solve the problems of quantitative aptitude along with that of the reasoning.

## Example:

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 $(64-14) - 5 + 10 - 2 \times 3$ =  $30 - (2 \times 6 + 15 \div 3) = 12 + 5 = 17$ Now,  $30 - 17 + 8 \times 3 \div 6 = 30 - 17 + 8 \times \frac{1}{2} = 30 - 17 + 4 = 17$ 

• If + means  $\div$ , - means ×,  $\div$  means + and × means -, then the value of  $36 \times 12 + 4 - 6 + 2 - 3$  when simplified is

10	
(a) 12	(b) 38
(c) 42	(d) 56
(e) None of these	

## Answer: (c)

**Explanation:** Option (c) is correct. Using proper signs in the given expression we get  $36-12 \div 4 + 6 \div 2 \times 3 = 36-3+3 \times 3 = 36-3+9 = 42$ .

If P denotes  $\div$ , Q denotes  $\times$ , R denotes + and S denotes -, then 18Q12 P4 R5 S6 =? (a) 46 (b) 53 (c) 64 (d) 75 (e) None of these

## Answer: (b)

**Explanation:** Option (b) is correct: Using correct symbols, we get  $18 \times 12 \div 4 + 5 - 6 = 18 \times 3 + 5 - 6 = 54 + 5 - 6 = 53$ 

If '+' means 'minus', '×' means 'divided by', '+' means 'plus' and '-' means 'multiplied by', then which of the following will be the value of the expression  $252 \times 9 - 5 + 32 \div 92$ ? (a) 95 (b) 168 (c) 192 (d) 200 (e) None of these

## Answer (d)

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**Explanation:** Option (d) is correct. Putting the proper signs in the given expression  $252 \div 9 \times 5 - 32 + 92 = 28 \times 5 - 32 + 92 = 140 - 32 + 92 = 232 - 32 = 200$ .

If L stands for +, M stands for -, N stands for  $\times$ , p stands for  $\div$ , then 14 N 10 L 42 P 2 M 8 =? (a) 153 (b) 216 (c) 248 (d) 251 (e) None of these

## Answer (A)

**Explanation:** Option (A) is correct. Using the proper signs, we get-Given expression  $= 14 \times 10 + 42 \div 2 - 8 = 14 \times 10 + 21 - 8$ = 140 + 21 - 8 = 161 - 8 = 153.

If '+' means 'divided by', '-'means 'added to', '×' means 'subtracted from' and '÷'means 'multiplied by', then what is the value of  $24 \div 12 - 18 + 9$ ? (a) - 25 (b) 0.72 (c) 15.30 (d) 290 (e) None of these

## Answer (d)

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**Explanation:** Option (d) is correct. Using the correct symbols, we have: Given expression  $= 24 \times 12 + 18 \div 9 = 288 + 2 = 290$ .

If  $\times$  means  $\div$ , - means  $\times$ ,  $\div$  means + and + means -, then  $(3-15\div19)\times8+6=?$ (A) - 1 (b) 2 (c) 4 (d) 8 (e) None of these

#### Answer (b)

**Explanation:** Option (b) is correct. Using the correct symbols we have-Given expression  $=(3 \times 15 + 19) \div 8 - 6 = 64 \div 8 - 6 = 8 - 6 = 2$ .

If '-' stands for 'division', '+' for 'multiplication', ' $\div$ ' for 'subtraction' and ' $\times$ ' for 'addition', then which one of the following equations is correct?

(a)  $4 \times 5 + 9 - 3 \div 4 = 15$ (b)  $4 \times 5 \times 9 + 3 \div 4 = 11$ (c)  $4 - 5 \div 9 \times 3 - 4 = 17$ (d)  $4 \div 5 + 9 - 3 + 4 = 18$ (e) None of these

#### Answer (A)

**Explanation:** Option (A) is correct. Using the proper notations in (a), we get the statement as:  $4+5\times9\div3-4=4+5\times3-4=4+15-4=15$ .

If '+' stands for 'division', ' $\div$ ' stands for 'multiplication', ' $\times$ ' stands for 'subtraction' and ' $\times$ ' stands for 'addition', which one of the following is correct?

(a)  $18 \div 6 \times 7 + 5 - 2 = 22$ (b)  $18 \times 6 + 7 \div 5 - 2 = 16$ (c)  $18 \div 6 - 7 + 5 \times 2 = 20$ (d)  $18 + 6 \div 7 \times 5 - 2 = 18$ (e) None of these

## Answer: (d)

**Explanation:** Option (d) is correct. Using the proper notations in (D) we get the statement as:  $18 \div 6 \times 7 - 5 + 2 = 3 \times 7 - 5 + 2 = 21 - 5 + 2 = 18$ .

If '-' stands for 'division', '+' for 'multiplication', ' $\div$ ' for 'subtraction' and ' $\times$ ' for 'addition' then which one of the following equations is correct?

(a)  $6+20-12 \div 7-1=38$ (b)  $6-20 \div 12 \times 7+1=57$ (c)  $6+20-12 \div 7 \times 1=62$ (d)  $6 \div 20 \times 12+7-1=70$ (e) None of these

## Answer (d)

**Explanation:** Option (d) is correct. Using the proper notations in (D), we get the statement as:  $6-20+12 \times 7 \div 1 = 6-20+84 = 90-20 = 70$ 

- If '×' stands for 'addition', '<' for 'subtraction', '+' for 'division', '>' for 'multiplication', '-' for 'qual to', for 'greater than' '=' for 'less than', then state which of the following is true ? (a)  $3 \times 4 > 2 - 9 + 3 < 3$ (b)  $5 \times 3 < 7 \div 8 + 4 \times 1$ (c)  $5 > 2 + 2 = 10 < 4 \times 8$ 
  - (d)  $3 \times 2 < 4 \div 16 > 2 + 4$
  - (e) None of these

## Answer (c)

**Explanation:** Option (c) is correct. Using the proper notations in (C), we get the statement as:  $5 \times 2 \div 2 < 10 - 4 + 8 \text{ or } 5 \times 1 < 18 - 4 \text{ or } 5 < 14$ , which is true.

## Case - 2nd

Interchange of Signs and Numbers: In this type, interrelated signs and numbers are interchanged of corresponds also.

## Example:

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**Directions:** In each of the following questions, an equation becomes incorrect due to the interchange of two signs. One of the four alternations under it specifies the interchange of signs in the equation, which when made will make the equation correct. Find the correct alternative.

•  $12 \div 2 - 6 \times 3 + 8 = 16$ 

(a)  $\div$  and + (b)  $\times$  and +(c) - and + (d)  $\div$  and  $\times$ 

(e) None of these

Answer (c) Explanation: Option (c) is correct. On interchanging - and +, we get Given expression  $= 12 \div 2 + 6 \times 3 - 8$   $= 6 + 6 \times 3 - 8$ = 6 + 18 - 8 = 16

•  $9+5 \div 4 \times 3 - 6 = 12$ 

(a) + and $\times$	(b) ÷ and -
(c) + and -	(d) $\div$ and $+$
(e) None of these	

(e) None of these

#### Answer (b)

**Explanation:** Option (b) is correct. On interchanging  $\div$  and -, we get Given expression  $=9+5-4\times3\div6$  $=9+5-4\times3\div6$ 

$$=9+5-4\times\frac{1}{2}=9+5-2=12$$

 $\begin{array}{ll} 16-8\div 4+5\times 2=8\\ (a)\ \div\ and\ \times \\ (c)\ \times\ and\ - \\ (w)\ None\ of\ these \end{array} \tag{b) - and +}$ 

## Answer (d)

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**Explanation:** Option (d) is correct. On interchanging - and  $\div$ , we get Given expression =  $16 \div 8 - 4 + 5 \times 2$ = 2 - 4 + 10 = 8

$2 \times 3 + 6 - 12 \div 4 = 17$	
(a) - and ÷	(b) + and ÷
(c) + and -	(d) $\times$ and +
(e) None of these	

#### Answer (d)

**Explanation:** Option (d) is correct. On interchanging  $\times$  and +, we get Given expression  $= 2+3\times6-12\div4$  $= 2+3\times6-3$ = 2+18-3=17

$5 + 6 \div 3 - 12 \times 2 = 17$	
(a) $\div$ and $\times$	(b) + and $\times$
(c) + and -	(d) + and $\div$
(e) None of these	

## Answer (a) Explanation: Option (a) is correct. On Interchanging $\div$ and $\times$ , we get Given expression $=5+6\times3-12\div2$ $=5+6\times3-6$ =5+18-6=17

## **Commonly Asked Questions**

**Directions:** In each of the following questions if the interchange are made in signs and numbers which one of the four equations would be correct?

• Given interchanging: sign  $\div$  and + and numbers 4 and 2

(a) $4+2 \div 1 = \frac{3}{2}$	(b) $2+4 \div 3 = 6$
(c) $4+2 \div 3 = 3$ (e) None of these	(d) $2+4 \div 5 = 8$

Answer (a)

**Explanation:** Option (a) is correct. On interchanging, we get  $2 \div 4 + 1 = \frac{1}{2} + 1 = \frac{3}{2}$ .

Given interchanging signs: - and x and number 3 and 6 (a)  $6-3\times2=9$  (b)  $3\times6-4=33$ (c)  $3-6\times8=10$  (d)  $6\times3-4=5$ (e) None of these

## Answer (c)

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**Explanation:** Option (c) is correct. On interchanging, we get  $6 \times 3 - 8 = 18 - 8 = 10$ .

Given interchanging signs: + and - and numbers 4 and 8(a)  $8-4 \div 12 = 8$ (b)  $4 \div 8 - 12 = 16$ (c) 4-8+12=0(d)  $8 \div 4 - 12 = 24$ (e) None of these

Answer (c) **Explanation:** Option (c) is correct. On interchanging, 8+4-12=12-12=0

Given interchanging signs: + and x and numbers 4 and 5 (a)  $5 \times 4 + 20 = 40$  (b)  $5 \times 4 + 20 = 104$ (c)  $5 \times 4 + 20 = 95$  (d)  $5 \times 4 + 20 = 85$ (e) None of these

Answer (b) **Explanation:** Option (b) is correct. On interchanging, we get  $4+5 \times 20 = 4+100 = 104$ .

Given interchanging signs: - and  $\div$  and numbers 4 and 8 (a)  $6-8 \div 4 = -1$  (b)  $4 \div 8 - 2 = 6$ (c)  $4-8 \div 6 = 2$  (d)  $8-6 \div 4 = 1$ (e) None of these

**Answer: (b) Explanation:** Option (b) is correct. On interchanging, we get  $8-4 \div 2 = 8-2 = 6$ .