

Ch 10 MATHEMATICAL OPERATIONS

ANSWERS AND EXPLANATIONS

EXERCISE 1

1. (e) $? = 540 \div 36 \times 12 + 75 - 55$

or $? = 15 \times 12 + 75 - 55$

or $? = 180 + 75 - 55 = 200$

2. (c) $? = 360 \div 24 + 56 \times 5 - 48$

or $? = 15 + 280 - 48 = 247$

3. (a) \times means $+$

$+$ means \div

\div means $-$

$-$ means \times

$5 - 7 \times 9 + 3 \div 2 = ?$

or $? = 5 \times 7 + 9 \div 3 - 2$

or $? = 5 \times 7 + 3 - 2$

or $? = 35 + 3 - 2 = 36$

4. (d)

$- \Rightarrow +$	$\times \Rightarrow -$
$\div \Rightarrow \times$	$+ \Rightarrow \div$

$20 \times 12 + 4 - 16 \div 5 = ?$

or $? = 20 - 12 \div 4 + 16 \times 5$

or $? = 20 - 3 + 80 = 97$

5. (b) $? = 20 R 16 K 5 M 10 T 8$

or $20 + 16 \times 5 \div 10 - 8$

or $20 + 16 \times \frac{5}{10} - 8$

or $20 + 8 - 8 = 20$

6. (a) $15 \div 5 \times 9 + 3 - 6 = ?$

or $? = 15 \times 5 - 9 \div 3 + 6$

or $? = 15 \times 5 - 3 + 6$

or $? = 81 - 3 = 78$

7. (e) $40 R 8 W 10 T 12 P 16 = ?$

or $? = 40 \div 8 \times 10 - 12 + 16$

or $? = 5 \times 10 - 12 + 16$

or $? = 66 - 12 = 54$

8. (b) $? = 288 \div 32 \times 6 - 45 + 9$

or $? = 9 \times 6 - 45 + 9$

or $? = 54 - 45 + 9 = 18$

9. (c) $40\$20@2\#40\star20\#38$

$40 - 20 \times 2 + 40 \div 20 + 38$

$= 40 - 20 \times 2 + \frac{40}{20} + 38$

$= 40 - 40 + 2 + 38$

10. (a) $60 T 48 P 8 W 6 R 9 = ?$

$\Rightarrow 60 + 48 \div 8 - 6 \times 9 = ?$

$\Rightarrow 60 + 6 - 54 = ?$

$\Rightarrow 12 = ?$

11. (e) $10 \uparrow 10=5 \uparrow 10 ? 50 \bullet 10$

$= 10 \times 10 - 5 \times 10 + 50 \div 10$

$10 \times 10 - 5 \times 10 + \frac{50}{10}$

$= 100 - 50 + 5$

$= 55$

12. (b) Using the given symbols, we have:

Given expression

$= 8 + 7 \times 8 \div 40 - 2 = 8 + 7 \times \frac{1}{5} - 2$

$= \frac{37}{5} = 7\frac{2}{5}$

13. (d) Using the proper symbols, we have:

Given expression $= 16 + 24 \div 8 - 6 \div 2 \times 3$

$= 16 + 3 - 3 \times 3$

$= 16 + 3 - 9 = 10.$

14. (d) Using the proper notations in (d), we get

$9 + 9 \div 9 - 9 \times 9$

$= 9 + 1 - 9 \times 9 = 9 + 1 - 81 = -71.$

\therefore option (d) is true.

15. (d) $40 + 12 \div 3 \times 6 - 60 = 4$

16. (c) $9 \times 8 + 8 \div 4 - 9 = 65$



17. (c) $24 \times 4 \div 8 + 4 = 24 \times \frac{1}{2} + 4 = 12 + 4 = 16$
18. (b) $20 + 12 - 4 \div 8 \times 6 = 29$
19. (d) Using the proper notations in (d), we get
 $8 \times 8 + 8 \div 8 - 8 = 8 \times 8 + 1 - 8$
 $= 64 + 1 - 8 = 57$
20. (b) Since, $20 \times 10 = 200$, therefore, $-$ means \times
 $8 + 4 = 12$, therefore, \div means $+$.
 $6 - 2 = 4$, therefore, \times means $-$.
and $12 \div 3 = 4$, therefore, $+$ means \div .
Now, given expression
 $= 100 \times 10 - 1000 + 1000 \div 100 - 10$
 $= 1000 - 1000 + 10 - 10 = 0$
21. (c) Using the proper signs, we get:
 $36 - 8 + 4 + 6 \div 2 \times 3 = 36 - 2 + 3 \times 3$
 $= 36 - 2 + 9$
 $= 45 - 2 = 43$
22. (c) Using proper notations, we have:
(1) given statement is $3 \div 2 + 4 < 9 + 3 - 1$
or $\frac{11}{2} < 2$, which is not true.
(2) given statement is $3 + 2 + 4 < 18 \div 3 - 2$
or $9 < 4$, which is not true.
(3) given statement is $3 + 2 - 4 > 8 \div 4 - 2$
or $1 > 0$, which is true.
(4) given statement is $3 \div 2 - 4 > 9 \div 3 - 3$
or $-\frac{5}{2} > 0$, which is not true. So, the statement
(c) is true.
23. (d) Using the correct symbols, we have:
Given expression $= 8 + 36 \div 6 - 6 \div 2 \times 3$
 $= 8 + 6 - 3 \times 3 = 5$
24. (b) Using the proper notations in (2), we get the statement as $5 \times 2 \div 2 < 10 - 4 + 2$ or $5 < 8$, which is true.
25. (a) Using the proper signs in the given expression, we get
 $175 \div 5 \times 20 - 3 \times 10 = 7 + 5 \times 20 - 3 \times 10$
 $= 7 + 100 - 30$
 $= 107 - 30 = 77$.
26. (a) Given that : $20 - 10 = 200$.
But, actually $20 \times 10 = 200$, so $-$ means \times .
Given that $8 \div 4 = 12$, But actually $8 \div 4 = 12$.
So, $+$ means $+$.
Given that : $6 \times 2 = 4$
But actually $6 - 2 = 4$. So, \times means $-$.
Thus, in the given mathematical language $-$ means \times ,
 \div means $+$ and \times means $-$ so, + Given expression
 $= 100 \times 10 - 1000 + 1000 \div 100 - 10$
 $1000 - 1000 + 10 - 10 = 0$.
27. (d) Using the correct symbols, we have
Given expression $= 24 \times 12 + 18 \div 9$
 $= 288 + 2 = 290$.
28. (b) Using the correct symbols, we have
Given expression $= (3 \times 15 + 19) \div 8 - 6$
 $= 64 \div 8 - 6 = 8 - 6 = 2$.
29. (a) Using the correct symbols, we have
Given expression
 $= \frac{(36-4)+8-4}{4 \times 8 - 2 \times 16 + 1} = \frac{32+8-4}{32-32+1} = \frac{4-4}{0+1} = 0$.
30. (d) Using the correct symbols, we have
Given expression $= 12 - 12 \times 28 \div 7 + 15$
 $= 12 - 12 \times 4 + 15 = 12 - 48 + 15 = 27 - 48$
 $= -21$.
31. (c) Using the correct symbols, we have
Given expression $= (10 \times 4) + (4 \times 4) - 6$
 $= 40 + 16 - 6$
 $= 56 - 6 = 50$.
32. (d) Using the proper notations in (4) we get the statement as $2 \times 5 - 6 + 2 = 6$
or $10 - 6 + 2 = 6$ or $6 = 6$, which is true.
33. (c) Using the proper notations in (3), we get the statement as $5 \times 2 + 2 < 10 - 4 + 8$
or $5 \times 1 < 18 - 4$ or $5 < 14$,
which is true.
34. (d) Interchanging ($+$ and \div) and (2 and 4), we get :
(1) $4 \div 2 + 3 = 3$ or $5 = 3$, which is false
(2) $2 \div 4 + 6 = 1.5$ or $6.5 = 1.5$, which is false.
(3) $2 + 4 \div 3 = 4$ or $\frac{10}{3} = 4$, which is false.



(4) $4 \div 2 + 6 = 8$ or $8 = 8$, which is true.

35. (c) The rule is $a + b = \left(\frac{a+b}{2}\right)^2$

$$3 + 5 = \left(\frac{3+5}{2}\right)^2 \text{ etc. } \therefore 11 + 3 = \left(\frac{11+3}{2}\right)^2 = 49$$

36. (d) The rule is the digits are jumbled in an order.

37. (a) By making the interchanges given in (1), we get the equation as

$$2 - 5 + 3 = 0 \text{ or } 0 = 0 \text{ which is true.}$$

By making the interchanges given in (2), we get the equation as

$$3 - 2 + 5 = 0 \text{ or } 6 = 0, \text{ which is false.}$$

By making the interchanges given in (3), we get the equation as

$$5 - 2 + 2 = 4 \text{ or } 4 = 0 \text{ which is not true.}$$

So, the answer is (1).

EXERCISE 2

1. (b) $a - b - c$ means $a < b < c$ and this relation implies $b > a < c$ i.e. $b + a - c$.

2. (c) $a + b \div c$ means that $a > b \nlessdot c$ and this relation implies that $c > b < a$ i.e. $c + b - a$.

3. (b) $a \times b \div c$ means $a \nlessdot b \nlessdot c$ and this relation implies that $c \nlessdot b \nlessdot a$ i.e. $c \times b \div a$.

4. (d) $a + b + c$ means $a > b > c$ and this relation does not imply that $b < a < c$, i.e. $b - a - c$.

5. (d) $a \times b \theta c$ is equivalent to $a < b = c$. Hence between a and b , we have $a < b$ or $a \neq b$ or $a > b$. Further $b = c$ implies that b and c are interchangeable.

Hence (1), (2) and (3) are not possible.

[Observe that (2) states $b < a$ which means $a > b$ which is not possible. Similarly in (3) $b > a$ which means $a < b$ which contradicts the hypothesis.]

(d) Is the correct answer which states that $a \neq b$ and $b > c$. Both statements are possible.

6. (a) Hypothesis (stem of the question) states $a \neq b$ & $b > c$.

Only relation not possible between a and b is that of equality. Hence (1), (2), (3), (4) are all possible from the relation between a and b .

Coming to the second relation only (1) is possible. Hence (1) is the answer.

7. (b) Note that in this question we have to determine which relation is not possible.

It is given that $a > b > c$.

Both relation in (1), (3) and (4) are possible. It is only (2) in which $b = c$ is not true. Hence (2) is the answer.

[It should be noted that in case of negation of implication it is enough to show that just one relation is not possible.]

8. (a) With the situations given,

$a \times b \theta c$ mean $a < b = c$

From option (1), $a \Delta b \phi c$ means $a > b \neq c$, this is not true.

From option (2), $a + b \theta c$ means $a \leq b = c$, this is true.

From option (3), $a \phi b \theta c$ means $a \neq b = c$, this is true. From option (4), $b \theta c \square a$ means $b = c \geq a$, this is true.

So, the answer is (1).

9. (b) With the notations given,

$c + b \times a$ means $c \leq b < a$

From option (1), $a \times b \theta c$ means $a < b = c$, this is not true.

From option (2), $c \Delta b \Delta a$ means $a > b > c$, this is true.

From option (3), $c \times b \times a$ means $a < b < c$, this is not true.

From option (4), $b \theta c \Delta a$ means $b = c > a$, this is not true.

10. (b) Using the proper notations in (b), we get the statement as $2 \div 1 + 20 \times 1 < 6 \times 4$ or $22 < 24$, which is true.

11. (b) Using the proper notations in (b), we get the statement as $10 = 2 \times 3 \times 2 - 2 \div 1$ or $10 = 10$, which is true.

12. (d) $A + D > C + E$



$$\Rightarrow A + D > (2B - D) + E \quad (\because C + D = 2B)$$

$$\Rightarrow A + D > (B + E) + (B - D)$$

$$\Rightarrow A + D > (C + D) + (B - D)$$

$$\Rightarrow A + D > B + C.$$

13. (b) $2C < A + E, A + E = C + D$

$$\Rightarrow 2C < C + D \Rightarrow C < D$$

...(1)

$$A + D = B + C, C < D \Rightarrow A < B \quad \dots(2)$$

$$2A > B + D, A < B \Rightarrow A > D \quad \dots(3)$$

$$A + E = C + D, A > D \Rightarrow E < C \dots(4)$$

14. (c). Using the usual notations, we have

(a) The statement is $a > b < c \Rightarrow a = c < b$,
which is false $[\because c > b]$

(b) The statement is $a > b < c \Rightarrow b < a > c$,
which is false. $[\because b < a]$

(c) The statement is $a > b < c \Rightarrow a < b > c$,
which is true

(d) The statement is $a > b < c \Rightarrow c < b < a$,
which is false. $[\because b < a]$

15. (a) Average age of all boys and girls

$$(A) = \frac{X + Y}{25}$$

$$\Rightarrow A_1 = (x @ y) \# 25$$

16. (c) $P_1 = \frac{P_2}{2} - 1,50,000$

$$\Rightarrow P_1 = (P_2 \# 2) \$ 150000$$

17. (c) $B = \frac{1}{4} \times 3G = \frac{3G}{4}$

$$\Rightarrow B = (3 \star G) \# 4$$

18. (b) $S_1 = \frac{40}{100} \times S_2 + 8,000$

$$\Rightarrow S_1 = [S_2 \star (40 \# 100)] @ 8,000$$

19. (d) $H = \frac{85}{100} \times M$

$$\Rightarrow H = (85 \# 100) \star M$$

TARA INSTITUTE

