

Mathematical Inequality & Coded Inequality Solution (TYS)

1. (e)

I. $\sqrt{x} - \frac{\sqrt{6}}{\sqrt{x}} = 0$

$\Rightarrow x - \sqrt{6} = 0 \Rightarrow x = \sqrt{6}$

II. $y^3 = 6^{3/2} = (\sqrt{6})^3$

$\Rightarrow y = \sqrt{6}$

2. (a)

I. समीकरण I $\times 3$ - समीकरण II से,
 $9x - 6y - 5x + 6y = 30 - 6$
 $\Rightarrow 4x = 24 \Rightarrow x = 6$

समीकरण I से,

$3 \times 6 - 2y = 10$
 $\Rightarrow 2y = 18 - 10 = 8$
 $\Rightarrow y = 4$

3. (d)

I. $x^2 + x - 12 = 0$
 $\Rightarrow x^2 + 4x - 3x - 12 = 0$
 $\Rightarrow x(x+4) - 3(x+4) = 0$
 $\Rightarrow (x-3)(x+4) = 0$
 $\Rightarrow x = 3$ या -4

II. $y^2 - 5y + 6 = 0$
 $\Rightarrow y^2 - 3y - 2y + 6 = 0$
 $\Rightarrow y(y-3) - 2(y-3) = 0$
 $\Rightarrow (y-2)(y-3) = 0$
 $\Rightarrow y = 2$ या 3

4. (c)

I. $x^2 + 9x + 18 = 0$
 $\Rightarrow x^2 + 6x + 3x + 18 = 0$
 $\Rightarrow x(x+6) + 3(x+6) = 0$
 $\Rightarrow (x+3)(x+6) = 0$
 $\Rightarrow x = -3$ या -6

II. $y^2 - 13y + 40 = 0$
 $\Rightarrow y^2 - 8y - 5y + 40 = 0$
 $\Rightarrow y(y-8) - 5(y-8) = 0$
 $\Rightarrow (y-5)(y-8) = 0$
 $\Rightarrow y = 5$ या 8

5. (b)

I. $\sqrt{x+6} = 11 - 6 = 5$
 $\Rightarrow x+6 = 25$
 $\Rightarrow x = 25 - 6 = 19$
II. $y^2 = 473 - 112 = 361$
 $\Rightarrow y = \sqrt{361} = \pm 19$

Directions:

6. (b)

I. $20x^2 - x - 12 = 0$
 $\Rightarrow 20x^2 - 16x + 4x - 12 = 0$
 $\Rightarrow 4x(5x-4) + 3(5x-4) = 0$
 $\Rightarrow (5x-4)(4x+3) = 0$
 $\Rightarrow 5x-4 = 0$ या $4x+3 = 0$

$\Rightarrow x = \frac{4}{5}$ या $-\frac{3}{4}$

II. $20y^2 + 27y + 9 = 0$
 $\Rightarrow 20y^2 + 15y + 12y + 9 = 0$
 $\Rightarrow 5y(4y+3) + 3(4y+3) = 0$
 $\Rightarrow (5y+3)(4y+3) = 0$

$\Rightarrow y = -\frac{3}{5}$ या $-\frac{3}{4}$

$\therefore x \geq y$

7. (d)

I. $x^2 = 106 + 218 = 324$

$\therefore x = \sqrt{324} = \pm 18$
II. $y^2 - 37y + 342 = 0$
 $\Rightarrow y^2 - 18y - 19y + 342 = 0$
 $\Rightarrow y(y-18) - 19(y-18) = 0$
 $\Rightarrow (y-19)(y-18) = 0$
 $\Rightarrow y = 19$ या 18

8. (e)

I. $\frac{7}{\sqrt{x}} + \frac{5}{\sqrt{x}} = \sqrt{x}$

$\Rightarrow 7 + 5 = \sqrt{x} \times \sqrt{x}$
 $\Rightarrow x = 12$

II. $y^2 - \frac{(12)^{5/2}}{\sqrt{y}} = 0$

$\Rightarrow y^{2-\frac{1}{2}} - (12)^{5/2} = 0$

$\Rightarrow y^{3/2} = 12^{5/2}$
 $\Rightarrow y = 12$

9. (c)

I. $19x + 4 = 0$
 $\Rightarrow 19x = -4$

$\Rightarrow x = -\frac{4}{19}$

II. $21y + 4 = 0$

$\Rightarrow y = -\frac{4}{21}$

10. (b)

I. $\frac{15}{\sqrt{x}} - \frac{2}{\sqrt{x}} = 6\sqrt{x}$

$\Rightarrow 15 - 2 = 6x$
 $\Rightarrow 13 = 6x$

$\Rightarrow x = \frac{13}{6}$

II. $\frac{\sqrt{y}}{4} + \frac{7\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

$\Rightarrow \frac{3\sqrt{y} + 7\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

$\Rightarrow \frac{10\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

$\Rightarrow 10y = 12$

$\Rightarrow y = \frac{12}{10} = \frac{6}{5}$

11. (b)

I. $6p^2 + 5p + 1 = 0$

$\Rightarrow (3p-1)(2p+1) = 0$

$\Rightarrow p = -\frac{1}{3}, -\frac{1}{2}$

II. $20q^2 + 9q + 1 = 0$

$\Rightarrow (4q+1)(5q+1) = 0$

$\Rightarrow q = -\frac{1}{4}, -\frac{1}{5}$

$\therefore p < q$

12. (a)

I. $3p^2 + 2p - 1 = 0$

$\Rightarrow (3p-1)(p+1) = 0$

$\Rightarrow p = \frac{1}{3}, -1$

II. $2q^2 + 7q + 6 = 0$

$\Rightarrow (2q+3)(q+2) = 0$

$\Rightarrow q = -\frac{3}{2}, -2$

$\therefore p > q$

13. (d)

I. $3p^2 + 15p + 18 = 0$

$\Rightarrow (3p+6)(p+3) = 0$

$\Rightarrow p = -2, -3$

II. $q^2 + 7q + 12 = 0$

$\Rightarrow (q+4)(q+3) = 0$

$\Rightarrow q = -3, -4$

$\therefore p \geq q$

14. (c)

I. $p = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$

II. $9q^2 - 12q + 4 = 0$

$\Rightarrow (3q - 2)^2 = 0$

$\Rightarrow q = \frac{2}{3}$

$\therefore p = q$

15. (e)

I. $p^2 + 13p + 42 = 0$

$\Rightarrow (p + 7)(p + 6) = 0$

$\Rightarrow p = -6, -7$

II. $q^2 = 36$

$\Rightarrow q = \pm 6$

$\therefore p \leq q$

16.(b) Conclusions

I. $Y \geq L$: Not true

II. $A > R$: True

17. (d) Conclusion

I. $P \geq R$: Not true

II. $A \leq Y$: Not true

18.(a) $A \geq B = C \leq D$

Conclusions : I. $A \geq C$: True

II. $D > A$: Not True

19.(b) $P < Q = M \geq N < O$

Conclusions: I. $Q > O$: Not true

II. $P < M$: True

20.(d) $T > R < S = U > V$; $U \geq M$; $T > R < S = U > V \geq M$

Conclusions : I. $M \geq R$: Not true II.

$T \leq M$: Not True

21.(a) $Q \leq P \geq C \leq N = T$

$O \geq N = T$

Conclusions : I. $O \geq T$: True II. $O = Q$: Not true

22.(d) $D > E = F \leq P < Q$

Conclusions: I. $E < Q$: Not True II. $F \geq P$: Not true

Directions :

(i) $P \odot Q \Rightarrow P \geq Q$

(ii) $P * Q \Rightarrow P \leq Q$

(iii) $P @ Q \Rightarrow P < Q$

(iv) $P \$ Q \Rightarrow P > Q$

(v) $P \% Q \Rightarrow P = Q$

23.(d) $J \$ K \Rightarrow J > K$

$K * T \Rightarrow K \leq T$

$T @ N \Rightarrow T < N$

$N \odot R \Rightarrow N \geq R$

Therefore, $J > K \leq T < N \geq R$

Conclusions:

I. $J \$ T \Rightarrow J > T$: Not true

II. $R * T \Rightarrow R \leq T$: Not true

III. $N \$ K \Rightarrow N > K$: True

IV. $R * K \Rightarrow R \leq K$: Not true

24.(d) $F \% W \Rightarrow F = W$

$W \odot R \Rightarrow W \leq R$

$R @ M \Rightarrow R < M$

$M \$ D \Rightarrow M > D$

Therefore,

$F = W \geq R < M > D$

Conclusions:

I. $D @ R \Rightarrow D < R$: Not true

II. $M \$ F \Rightarrow M > F$: Not true

III. $R @ D \Rightarrow R < D$: Not true

IV. $R * F \Rightarrow R \leq K$: True

25.(d) $H @ B \Rightarrow H < B$

$B * E \Rightarrow B \leq E$

$V \odot E \Rightarrow V \leq E$

$W \$ V \Rightarrow W > V$

Therefore, $H < B \leq E \leq V < W$

Conclusions : I. $W \$ E \Rightarrow W > E$:

True

II. $H @ E \Rightarrow H < E$: True

III. $H @ V \Rightarrow H < V$: True

IV. $W \$ B \Rightarrow W > B$: True

26.(e) $R \odot K \Rightarrow R \geq K$

$K * N \Rightarrow K \leq N$

$N \$ J \Rightarrow N > J$

$J \% H \Rightarrow J = H$

Therefore,

$R \geq K \leq N > J = H$

Conclusions : I. $R \$ N \Rightarrow R > N$: Not true

II. $J @ K \Rightarrow J < K$: Not true

III. $H @ N \Rightarrow H < N$: True

IV. $R \$ H \Rightarrow R > N$: Not true

27.(c) $K * D \Rightarrow K \leq D$

$D @ N \Rightarrow D > N$

$N \% M \Rightarrow N = M$

$M \odot W \Rightarrow M \geq W$

Therefore,

$K \leq D > N = M \geq W$

Conclusions:

I. $M @ K \Rightarrow M < K$: not True

II. $N @ K \Rightarrow N < K$: Not true

III. $M @ D \Rightarrow M < D$: True

IV. $W * N \Rightarrow W \leq N$: True

Directions :

$\odot \Rightarrow \leq$	$\% \Rightarrow \geq$	$* \Rightarrow >$
$@ \Rightarrow <$	$\$ \Rightarrow =$	

28.(b) $K @ V \Rightarrow K < V$

$V \odot N \Rightarrow V \leq N$

$N \% F \Rightarrow N \geq F$

Therefore,

$K < V \leq N \geq F$

Conclusions : I. $F @ V$

$\Rightarrow F < V$: Not true

II. $K @ N \Rightarrow K < N$: True

29.

(e) $H \odot W \Rightarrow H \leq W$

$W \$ M \Rightarrow W = M$

$M @ B \Rightarrow M < B$

Therefore, $H \leq W = M < B$

Conclusions: I. $B * H \Rightarrow B > H$:

True

II. $M \% H \Rightarrow M \geq H$: True

30.(d) $D \% B \Rightarrow D \geq B$

$B * T \Rightarrow B > T$

$T \$ M \Rightarrow T = M$

Therefore, $D \geq B > T = M$

Conclusions : I. $T \odot D \Rightarrow T \leq D$: Not true

II. $M \odot D \Rightarrow M \leq D$: Not true

31.(a) $M * T \Rightarrow M > T$

$T @ K \Rightarrow T < K$

$K \odot N \Rightarrow K \leq N$

Therefore, $M > T < K \leq N$

Conclusions : I. $N * T \Rightarrow N > T$:

True

II. $N * M \Rightarrow N > M$: Not true

32.(c) $R \$ J \Rightarrow R = J$

$J \% D \Rightarrow J \geq D$

$D * F \Rightarrow D > F$

Therefore, $R = J \geq D > F$

Conclusions : I. $D \$ R \Rightarrow D = R$: Not true

II. $D @ R \Rightarrow D < R$: Not true

Either I or II is true

Directions :

$\delta \Rightarrow \leq$	$@ \Rightarrow =$	$\odot \Rightarrow \geq$
$\% \Rightarrow >$	$* \Rightarrow <$	

33. $R * K \Rightarrow R < K$

$K \% D \Rightarrow K > D$

$D @ V \Rightarrow D = V$

$V \delta M \Rightarrow V \leq M$

Therefore, $R < K > D = V \leq M$

Conclusions: I. $R * D \Rightarrow R < D$: Not true

II. $V * R \Rightarrow K > D$

III. $D @ M \Rightarrow D = M$

Not true

IV. $M \% D \Rightarrow M > D$: Not true D is either smaller than or equal to M.

Therefore, either III or IV follows.

34.(b) $F \% N \Rightarrow F > N$

$N \odot W \Rightarrow W \geq W$

$W \delta Y \Rightarrow W \leq Y$

$Y * T \Rightarrow Y < T$

Therefore $F > N \geq W \leq Y < T$

Conclusions: I. $F \% W \Rightarrow F > W$: True

II. $T \% N \Rightarrow T > N$: Not true

III. $N \% Y \Rightarrow N > Y$: Not true

IV. $T \% W \Rightarrow T > W$: true

35.(e) $E < F \leq G = H > S$

Conclusions : I. $G > S$: true II. $F \leq H$: true