

## Mathematical Inequality SET-2

1. (d)

(4) I.  $x^2 - 7x + 12 = 0$   
 $\Rightarrow x^2 - 4x - 3x + 12 = 0$   
 $\Rightarrow x(x-4) - 3(x-4) = 0$   
 $\Rightarrow (x-3)(x-4) = 0 \Rightarrow x = 3$  या 4  
 II.  $y^2 - 12y + 32 = 0$   
 $\Rightarrow y^2 - 8y - 4y + 32 = 0$   
 $\Rightarrow y(y-8) - 4(y-8) = 0$   
 $\Rightarrow (y-4)(y-8) = 0 \Rightarrow y = 4$  या 8  
 स्पष्टतः  $x \leq y$

2. (a)

(1) समीकरण I  $\times 3$  - समीकरण II  $\times 5$  से  
 $15x + 6y - 15x - 35y = 93 - 180$   
 $\Rightarrow -29y = -87 \Rightarrow y = \frac{87}{29} = 3$   
 समीकरण I से,  $5x + 2 \times 3 = 31$   
 $\Rightarrow 5x = 31 - 6 = 25 \Rightarrow x = 5$   
 स्पष्टतः  $x > y$

3. (c)

(3) I.  $2x^2 + 7x + 4x + 14 = 0$   
 $\Rightarrow x(2x+7) + 2(2x+7) = 0$   
 $\Rightarrow (x+2)(2x+7) = 0$   
 $\therefore x = -2$  या  $-\frac{7}{2}$   
 II.  $4y^2 + 2.2y.3 + 9 = 0$   
 $\Rightarrow (2y+3)^2 = 0 \Rightarrow 2y+3 = 0$   
 $\therefore y = -\frac{3}{2}$  स्पष्टतः  $x < y$

4. (b)

(2) I.  $x^2 - 4x - 3x + 12 = 0$   
 $\Rightarrow x(x-4) - 3(x-4) = 0$   
 $\Rightarrow (x-3)(x-4) = 0$   
 $\therefore x = 3$  या 4  
 II.  $y^2 + 4y - 3y - 12 = 0$   
 $\Rightarrow y(y+4) - 3(y+4) = 0$   
 $\Rightarrow (y-3)(y+4) = 0$   
 $\therefore y = 3$  या -4  
 स्पष्टतः  $x \geq y$

5. (e)

(5) I.  $x^4 = 227 + 398 = 625 = 5^4$   
 $\Rightarrow x = 5$   
 II.  $y^2 = 346 - 321 = 25 = 5^2 \Rightarrow y = 5$   
 स्पष्टतः  $x = y$

6. (a)

(1) I.  $x^2 - 8x + 15 = 0$   
 $\Rightarrow x^2 - 5x - 3x + 15 = 0$   
 $\Rightarrow x(x-5) - 3(x-5) = 0$   
 $\Rightarrow (x-3)(x-5) = 0$   
 $\therefore x = 3$  या 5  
 II.  $y^2 - 3y + 2 = 0$   
 $\Rightarrow y^2 - 2y - y + 2 = 0$

$\Rightarrow y(y-2) - 1(y-2) = 0$   
 $\Rightarrow (y-1)(y-2) = 0$   
 $\therefore y = 1$  या 2  
 स्पष्टतः  $x > y$

7. (e)

(5) I.  $x = \sqrt{121} = \pm 11$   
 II.  $y^2 = 121$   
 $\therefore y = \sqrt{121} = \pm 11$

8. (3)

(3) I.  $3x^2 + 8x + 4 = 0$   
 $\Rightarrow 3x^2 + 6x + 2x + 4 = 0$   
 $\Rightarrow 3x(x+2) + 2(x+2) = 0$   
 $\Rightarrow (x+2)(3x+2) = 0$   
 $\therefore x = -2$  या  $-\frac{2}{3}$

II.  $4y^2 - 19y + 12 = 0$   
 $\Rightarrow 4y^2 - 16y - 3y + 12 = 0$   
 $\Rightarrow 4y(y-4) - 3(y-4) = 0$   
 $\Rightarrow (y-4)(4y-3) = 0$   
 $\therefore y = 4$  या  $\frac{3}{4}$

स्पष्टतः  $x < y$

9. (d)

(4) I.  $x^2 = 365 + 364 = 729$   
 $\therefore x = \sqrt{729} = \pm 27$   
 II.  $y - \sqrt{324} = \sqrt{81}$   
 $\Rightarrow y - 18 = 9$   
 $\Rightarrow y = 27$   
 स्पष्टतः,  $x \leq y$

10. (e)

(5) I.  $225x^2 = 4$   
 $\Rightarrow x^2 = \frac{4}{225} \Rightarrow x = \pm \frac{2}{15}$   
 II.  $\sqrt{225y} + 2 = 0$   
 $\Rightarrow \sqrt{225y} = -2$   
 वर्ग करने पर,  
 $225y = 4$   
 $\Rightarrow y = \frac{4}{225}$

11. (b)

I.  $x^3 = 878 + 453 = 1331$   
 $\therefore x = \sqrt[3]{1331} = 11$   
 II.  $y^2 = 82 + 39 = 121$   
 $\therefore y = \sqrt{121} = \pm 11$

12. (e)

I.  $9x - 4x = 54.55 + 15.45$   
 $\Rightarrow 5x = 70 \Rightarrow x = 14$   
 II.  $\sqrt{y+155} = 7 + 6 = 13$   
 $\Rightarrow y + 155 = 169$   
 $\Rightarrow y = 169 - 155 = 14$

13. (a)

From III and I

$29x + 2y = 190$  ... (i)

From III and II

$23x + y = 146$  ... (ii)

Again from (i) and (ii), we get

$x = 6, y = 8$  and  $z = 8$

$\therefore x < y = z$

14. (e)

$x = \sqrt{6 \times 6} = 6$

From II and III

$4z = 28$

$\therefore z = 7$

again  $2y = 33 - 21 = 12$

$\therefore y = 6$

$\therefore x = y < z$

15. (e)

From I  $x + y = 11$

and III  $xy = 28$

$x = 7$  and  $y = 4$

again,  $7 - 4 + z = 0$

$\therefore z = -3$

$x > y > z$

16. (b)

I.  $6a^2 - 25a + 25 = 0$   
 $\Rightarrow (2a-5)(3a-5) = 0$   
 $\Rightarrow a = \frac{5}{2}$  or  $\frac{5}{3}$

II.  $15b^2 - 16b + 4 = 0$   
 $\Rightarrow (3b-2)(5b-2) = 0$   
 $\Rightarrow b = \frac{2}{3}$  or  $\frac{2}{5}$   
 $\therefore a > b$

17. (a)

I.  $2a^2 + 3a + 1 = 0$   
 $\Rightarrow (2a+1)(a+1) = 0$

$\Rightarrow a = -\frac{1}{2}$  or  $-1$

II.  $12b^2 + 7b + 1 = 0$

$\Rightarrow (4b+1)(3b+1) = 0$

$\Rightarrow b = -\frac{1}{4}$  or  $-\frac{1}{3}$

$\therefore a < b$