**Quiz Date: 20th March 2020**

Directions (1-5): In the following questions two equations numbered I and II are given. You have to solve both the equations and–
(a) if p > q
(b) if p ≥ q
(c) if p < q
(d) if p ≤ q
(e) if p = q or the relationship cannot be established.

Q1. I. $6p^2 + 5p + 1 = 0$
II. $20q^2 + 9q = -1$

Q2. I. $3p^2 + 17p + 10 = 0$
II. $10q^2 + 9q + 2 = 0$

Q3. I. $p^2 + 24 = 10p$
II. $2q^2 + 18 = 12q$

Q4. I. $5p + 2q = 96$
II. $3(7p + 5q) = 489$

Q5. I. $\frac{15}{\sqrt{p}} - \frac{9}{\sqrt{p}} = p^{\frac{1}{2}}$
II. $q^{10} - (36)^5 = 0$

Directions (6-10): Solve the following equations and mark the correct option.
(a) if x > y
(b) if x ≥ y
(c) if y > x
(d) if y ≥ x
(e) if x = y or no relation can be established

Q6. I. $7x^2 - 23x + 18 = 0$
II. $4y^2 - 9y + 5 = 0$

Q7. I. $10x^2 - 11x - 6 = 0$
II. $y^2 + 5y + 6 = 0$

Q8. I. $13x^2 - 29x + 16 = 0$
II. $6y^2 - 11y + 5 = 0$

Q9. I. $x = \sqrt{169}$
II. $(y - 1)^2 = 144$

Q10. I. $7x + 11y = 29$

II.11x + 7y = 25



Directions (11-15): In each of these questions, two equations I and II are given. You have to solve both the equations and give answer
(a) if $x > y$
(b) if $x \geq y$
(c) if $x < y$
(d) if $x \leq y$
(e) if $x = y$ or no relation can be established between $x$ and $y$

Q11. I. $x^2 - 264 = 361$
II. $y^3 - 878 = 453$

Q12. I. $679x^2 - 168x^2 = 3066$
II. $\sqrt{144}y^3 - 9y^3 = 1536$

Q13. I. $x^2 - 11x + 24 = 0$
II. $2y^2 - 9y + 9 = 0$

Q14. I. $\frac{12}{\sqrt{x}} - \frac{23}{\sqrt{x}} = 5\sqrt{x}$
II. $\frac{\sqrt{y}}{12} - \frac{5\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

Q15. I. $x^3 - 468 = 1729$
II. $y^2 - 1733 + 1564 = 0$

**Solutions**

S1. Ans.(c)
Sol. $6p^2 + 5p + 1 = 0$
$6p^2 + 3p + 2p + 1 = 0$
$3p(2p + 1) + 1(2p + 1) = 0$
$\Rightarrow p = \frac{-1}{3}, \frac{-1}{2}$
$20q^2 + 9q + 1 = 0$
$\Rightarrow 20q^2 + 5q + 4q + 1 = 0$
$5q(4q + 1) + 1(4q + 1) = 0$

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

S2. Ans.(c)
Sol. $3p^2 + 17p + 10 = 0$
$3p^2 + 15p + 2p + 10 = 0$
$3p(p + 5) + 2(p + 5) = 0$
$\Rightarrow p = -5, \frac{-2}{3}$
$10q^2 + 9q + 2 = 0$
$\Rightarrow 10q^2 + 5q + 4q + 2 = 0$
$5q(2q + 1) + 2(2q + 1) = 0$
$\Rightarrow q = \frac{-2}{5}, \frac{-1}{2}$
$\therefore p < q$

S3. Ans.(a)
Sol.
$p^2 + 24 = 10p$
$\Rightarrow p^2 - 10p + 24 = 0$
$p^2 - 6p - 4p + 24 = 0$
$p(p - 6) - 4(p - 6) = 0$
$\therefore p = 6, 4$
$2q^2 + 18 = 12q$
$\Rightarrow 2q^2 - 12q + 18 = 0$
$2q^2 - 6q - 6q + 18 = 0$
$\Rightarrow 2q(q - 3) - 6(q - 3) = 0$
$\Rightarrow q = 3, 3$
$\therefore p > q$

S4. Ans.(a)
Sol. $5p + 2q = 96$ ...(× 5)
$7p + 5q = \frac{489}{3} = 163$ ...(× 2)
$\Rightarrow 25p + 10q = 480$ ...(i)
$14p + 10q = 326$ ...(ii)
Subtract (ii) from (i)
$11p = 480 - 326$
$\Rightarrow p = \frac{154}{11} = 14$
Now, $5p + 2q = 96$
$2q = 96 - 5 \times 14$
$q = \frac{96-70}{2} = 13$
$\therefore p > q$

S5. Ans.(b)
Sol.

$\frac{15}{\sqrt{p}} - \frac{9}{\sqrt{p}} = p^{\frac{1}{2}}$
$\Rightarrow 6 = \sqrt{p} \times \sqrt{p}$
$p = 6$
$q^{10} - (36)^5 = 0$
$q^{10} = (6^2)^5$
$\Rightarrow q = \pm 6$
$\therefore p \geq q$

S6. Ans.(a)
Sol.
I. $7x^2 - 23x + 18 = 0$
$7x^2 - 14x - 9x + 8 = 0$
$(7x - 9)(x - 2) = 0$
$x = \frac{9}{7}, 2$
II. $4y^2 - 9y + 5 = 0$
$4y^2 - 4y - 5y + 5 = 0$
$4y(y - 1) - 5(y - 1) = 0$
$(4y - 5)(y - 1) = 0$
$y = \frac{5}{4}, 1$
$\Rightarrow x > y$

S7. Ans.(a)
Sol.
I. $10x^2 - 11x - 6 = 0$
$5x(2x - 3) + 2(2x - 3) = 0$
$(5x + 2)(2x - 3) = 0$
$x = -\frac{2}{5}, \frac{3}{2}$

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

S8. Ans.(b)
Sol.
I. $13x^2 - 29x + 16 = 0$
$13x^2 - 13x - 16x + 16 = 0$
$13x(x - 1) - 16(x - 1) = 0$
$(13x - 16)(x - 1) = 0$
$x = \frac{16}{13}, 1$

II. $6y^2 - 11y + 5 = 0$
$6y^2 - 6y - 5y + 5 = 0$
$6y(y - 1) - 5(y - 1) = 0$
$(6y - 5)(y - 1) = 0$
$y = \frac{5}{6}, 1$
$\Rightarrow x \geq y$

S9. Ans.(b)
Sol.
I. $x = \sqrt{169} = 13$
II. $(y - 1)^2 = 144$
$y - 1 = 12$ or $y - 1 = -12$
$y = 13$ or $y = -11$
$\Rightarrow x \geq y$



S10. Ans.(c)
Sol.
Adding I & II
$18x + 18y = 54 \Rightarrow x + y = 3$ ...(iii)
Subtracting II from I
$-4x + 4y = 4 \Rightarrow -x + y = 1$ ...(iv)
Solving (iii) & (iv)
$y = 2$
$x = 1$
$\Rightarrow y > x$

S11. Ans.(e)
Sol.
I. $x^2 - 264 = 361$
or, $x^2 = 361 + 264$
$\therefore x^2 = 625$
$\therefore x = \sqrt{625} = \pm 25$

II. $y^3 - 878 = 453$
or, $y^3 = 453 + 878$
or, $y^3 = 1331$
$\therefore y = \sqrt[3]{1331} = 11$

Hence no relation can be established.

S12. Ans.(c)

Sol.

I. $679x^2 - 168x^2 = 3066$
$511x^2 = 3066$
$x^2 = 6$
$x = \pm\sqrt{6}$

II. $\sqrt{144}y^3 - 9y^3 = 1536$
$12y^3 - 9y^3 = 1536$
$3y^3 = 1536$
$y = 8$

$y > x$



S13. Ans.(b)
Sol.
I. $x^2 - 11x + 24 = 0$
$\Rightarrow x^2 - 8x - 3x + 24 = 0$
$\Rightarrow x(x-8) - 3(x-8) = 0$
$\Rightarrow (x-3)(x-8) = 0$
$\therefore x = 3 \; or \; 8$
II. $2y^2 - 9y + 9 = 0$
$\Rightarrow 2y^2 - 3y - 6y + 9 = 0$
$\Rightarrow y(2y-3) - 3(2y-3) = 0$
$\Rightarrow (2y-3)(y-3)$
$\therefore y = \frac{3}{2} \; or \; 3$
Clearly $x \geq y$

S14. Ans.(a)
Sol.
I. $12 - 23 = 5\sqrt{x} \times \sqrt{x}$
$\Rightarrow -11 = 5x$
$\Rightarrow x = \frac{-11}{5}$
II. $\frac{\sqrt{y} - 5\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$
$\Rightarrow -4\sqrt{y} \times \sqrt{y} = 12$
$\Rightarrow -4y = 12$
$\Rightarrow y = -3$
$x > y$

S15. Ans.(b)
Sol.
I. $x^3 = 1729 + 468 = 2197$
$\therefore x = \sqrt[3]{2197} = 13$
II. $y^2 = 1733 - 1564 = 169$
$\therefore y = \sqrt{169} = \pm 13$
$x \geq y$