Quiz Date: 4th May 2020

Directions (1-15): In each of the following questions two equations are given. Solve the equations and give answer

I. $8x^2 + 6x = 5$

Q1.   II. $12y^2 - 22y + 8 = 0$

(a) If $x < y$

(b) If $x \leq y$

(c) If $x > y$

(d) If $x \geq y$

(e) If $x = y$ or relationship between x and y cannot be established

I. $18x^2 + 18x + 4 = 0$

Q2.   II. $12y^2 + 29y + 14 = 0$

(a) If $x < y$

(b) If $x \leq y$

(c) If $x > y$

(d) If $x \geq y$

(e) If $x = y$ or relationship between x and y cannot be established

I. $x^2 - 16 = 0$

II. $y^2 - 9y + 20 = 0$

Q3.

(a) If $x < y$

(b) If $x \leq y$

(c) If $x > y$

(d) If $x \geq y$

(e) If $x = y$ or relationship between x and y cannot be established

I. $x^2 - 32 = 112$

Q4.   II. $y - \sqrt{169} = 0$

(a) If $x < y$

(b) If $x \leq y$

(c) If $x > y$

(d) If $x \geq y$

(e) If $x = y$ or relationship between x and y cannot be established

I. $2x^2 + 11x + 14 = 0$

Q5.   II. $4y^2 + 12y + 9 = 0$

(a) If $x < y$

(b) If $x \leq y$

(c) If $x > y$

(d) If $x \geq y$

(e) If x = y or relationship between x and y cannot be established

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

Q6. II. $y^3 - 6^{\frac{3}{2}} = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or relationship between x and y cannot be determined

I. $3x - 2y = 10$

Q7. II. $5x - 6y = 6$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or relationship between x and y cannot be determined
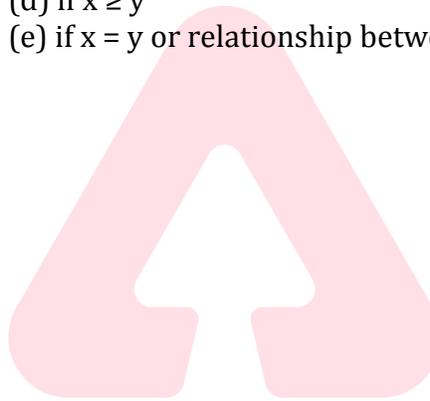
I. $x^2 + x - 12 = 0$

Q8. II. $y^2 - 5y + 6 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or relationship between x and y cannot be determined

I. $x^2 + 9x + 18 = 0$

Q9. II. $y^2 - 13y + 40 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or relationship between x and y cannot be determined

I. $\sqrt{x+6} = \sqrt{121} - \sqrt{36}$

Q10. II. $y^2 + 112 = 473$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or relationship between x and y cannot be determined

I. $x^2 - 24x + 144 = 0$

Q11. II. $y^2 - 26y + 169 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or no relationship can be established between x and y.

I. $2x^2 + 3x - 20 = 0$

Q12. II. $2y^2 + 19y + 44 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or no relationship can be established between x and y.

I. $6x^2 + 77x + 121 = 0$

Q13. II. $y^2 + 9y - 22 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or no relationship can be established between x and y.

I. $x^2 - 6x = 7$

Q14. II. $2y^2 + 13y + 15 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or no relationship can be established between x and y.

I. $10x^2 - 7x + 1 = 0$

Q15. II. $35y^2 - 12y + 1 = 0$

(a) if x < y
(b) if x > y
(c) if x ≤ y
(d) if x ≥ y
(e) if x = y or no relationship can be established between x and y.

Solutions

S1. Ans.(b)
Sol.
I. $8x^2 + 6x - 5 = 0$
$8x^2 + 10x - 4x - 5 = 0$
$2x(4x + 5) - 1(4x + 5) = 0$
$(4x + 5)(2x - 1) = 0$
$x = \dfrac{-5}{4}, \dfrac{1}{2}$
II. $12y^2 - 22y + 8 = 0$
$12y^2 - 16y - 6y + 8 = 0$
$4y(3y - 4) - 2(3y - 4) = 0$
$(3y - 4)(4y - 2) = 0$
$y = \dfrac{4}{3}$ or $\dfrac{2}{4}$
y ≥ x

S2. Ans.(d)
Sol.
I. $18x^2 + 18x + 4 = 0$
$18x^2 + 12x + 6x + 4 = 0$
$6x(3x + 2) + 2(3x + 2) = 0$
$(3x + 2)(6x + 2) = 0$
$x = \dfrac{-2}{3}$ or $\dfrac{-1}{3}$
II. $12y^2 + 29y + 14 = 0$
$12y^2 + 21y + 8y + 14 = 0$
$3y(4y + 7) + 2(4y + 7) = 0$
$(4y + 7)(3y + 2) = 0$
$y = \dfrac{-7}{4}$ or $\dfrac{-2}{3}$
x ≥ y

S3. Ans.(b)
Sol.

I. $x^2 - 16 = 0$
   $x = \pm 4$
II. $y^2 - 9y + 20 = 0$
 $y^2 - 5y - 4y + 20 = 0$
   $y(y - 5) - 4(y - 5) = 0$
   $(y - 5)(y - 4) = 0$
   $y = 5$ or 4
   $y \geq x$
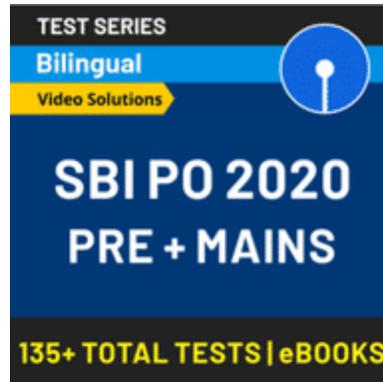
S4. Ans.(a)
Sol.
I. $x^2 = 144$
   $x = \pm 12$
II. $y = \sqrt{169}$
   $y = 13$
   $y > x$

S5. Ans.(a)
Sol.
I. $2x^2 + 11x + 14 = 0$
   $2x^2 + 7x + 4x + 14 = 0$
   $x(2x + 7) + 2(2x + 7) = 0$
   $x = \dfrac{-7}{2}$ or -2

II. $4y^2 + 12y + 9 = 0$
   $4y^2 + 6y + 6y + 9 = 0$
   $2y(2y + 3) + 3(2y + 3) = 0$
   $(2y + 3)(2y + 3) = 0$
   $y = \dfrac{-3}{2}$ or $\dfrac{-3}{2}$
   $y > x$

S6. Ans.(e)

Sol.

I. $\sqrt{x} \times \sqrt{x} = \sqrt{6} \Rightarrow x = \sqrt{6}$

II. $y^3 = 6^{\frac{3}{2}} \Rightarrow y = \left(6^{\frac{3}{2}}\right)^{\frac{1}{3}} = 6^{\frac{1}{2}} = \sqrt{6}$

$x = y$

S7. Ans.(b)
Sol.

On (i)x3 – (ii)

$$9x - 6y = 30$$
$$\underline{-5x + 6y = -6}$$
$$4x = \ \ 24 \Rightarrow x = 6$$
$$y = 4; \qquad x > y$$

S8. Ans.(e)
Sol.

I. $x^2 + x - 12 = 0$

$x^2 + 4x - 3x - 12 = 0$

$x(x + 4) - 3(x + 4) = 0$

$(x + 4)(x - 3) = 0$

$x = -4, 3$

II. $y^2 - 5y + 6 = 0$

$y^2 - 3y - 2y + 6 = 0$

$y(y - 3) - 2(y - 3) = 0$

$(y - 3)(y - 2) = 0$

$y = 3, 2$

$no \ relation$

S9. Ans.(a)
Sol.

I. $x^2 + 6x + 3x + 18 = 0$

$x(x + 6) + 3(x + 6) = 0$

$(x + 6)(x + 3) = 0$

$x = -6, -3$

II. $y^2 - 8y - 5y + 40 = 0$

$y(y - 8) - 5(y - 8) = 0$

$(y - 8)(y - 5) = 0$

$y = 8, 5$

$x < y$

S10. Ans.(d)
Sol.

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

S11. Ans.(a)
Sol.
I. $x^2 - 24x + 144 = 0$
$or, x^2 - 12x - 12x + 144 = 0$
$or, x(x - 12) - 12(x - 12) = 0$
$or, (x - 12)^2 = 0$
$\therefore x = 12$

II. $y^2 - 26y + 169 = 0$
$or, y^2 - 13y - 13y + 169 = 0$
$or, y(y - 13) - 13(y - 13) = 0$
$or, (y - 13)^2 = 0$
$\therefore y = 13$
Hence, $x < y$

S12. Ans.(d)
Sol.
$2y^2 + 3x - 20 = 0$
$Or, 2x^2 + 8x - 5x - 20 = 0$
$or, 2x(x + 4) - 5(x + 4) = 0$
$or, (2x - 5)(x + 4) = 0$
$or, x = \frac{5}{2}, -4$

II. $2y^2 + 19y + 44 = 0$
$Or, 2y^2 + 11y + 8y + 44 = 0$
$or, y(2y + 11) + 4(2y + 11) = 0$
$or, (y + 4)(2y + 11) = 0$
$y = -4, -\frac{11}{2}$ $Hence, x \geq y$

S13. Ans.(e)
Sol.

I. $6x^2 + 77x + 121 = 0$
$or, 6x^2 + 66x + 11x + 121 = 0$
$or, 6x(x + 11) + 11(x + 11) = 0$
$or, (6x + 11)(x + 11) = 0$
$or, x = -\frac{11}{6}, -11$

II. $y^2 + 9y - 22 = 0$
$or, y^2 + 11y - 2y - 22 = 0$
$or, y(y + 11) - 2(y + 11)$
$or, (y - 2)(y + 11) = 0$
$or, y = 2, -11$
Hence, no relationship can be established between x and y.
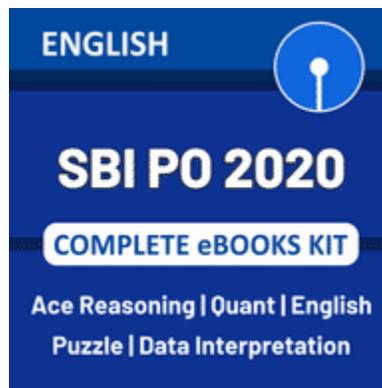
S14. Ans.(b)
Sol.
I. $x^2 - 6x = 7$
$or, x^2 - 6x - 7 = 0$
$or, x^2 - 7x + x - 7 = 0$
$or, x(x - 7) + 1(x - 7) = 0$
$or, (x + 1)(x - 7) = 0$
$or, x = -1, 7$

II. $2y^2 + 13y + 15 = 0$
$or, 2y^2 + 10y + 3y + 15 = 0$
$or, 2y(y + 5) + 3(y + 5) = 0$
$or, (2y + 3)(y + 5) = 0$
$or, y = -\frac{3}{2}, -5$
Hence, x > y

S15. Ans.(d)
Sol.

I. $10x^2 - 7x + 1 = 0$
$or, 10x^2 - 5x - 2x + 1 = 0$
$or, 5x(2x - 1) - 1(2x - 1) = 0$
$or, (5x - 1)(2x - 1) = 0$
$or, x = \frac{1}{5}, \frac{1}{2}$

II. $35y^2 - 12y + 1 = 0$
$or, 35y^2 - 7y - 5y + 1 = 0$
$or, 7y(5y - 1) - 1(5y - 1) = 0$
$or, (7y - 1)(5y - 1) = 0$
$or, y = \frac{1}{7}, \frac{1}{5}$
Hence, $x \geq y$

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