Quadratic Equations Questions for SBI PO Exam

Directions (1-5): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer

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

Q1. I. $2x^2 - 29x - 48 = 0$
II. $3y^2 - y - 30 = 0$

Q2. I. $12x^2 - x - 1 = 0$
II. $20y^2 - 41y + 20 = 0$

Q3. I. $12x^2 - 11x + 2 = 0$
II. $6y^2 - 5y + 1 = 0$

Q4. I. $x^2 - 11x + 30 = 0$
II. $y^2 - 8y + 15 = 0$

Q5. I. $6x^2 + 10x + 4 = 0$
II. $6y^2 + 7y + 2 = 0$

Directions (6-10): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer.

Q6. I. $4x^2 - 24x + 32 = 0$
II. $2y^2 - 21y + 55 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If x≥y
(c) If x<y
(d) If x≤y
(e) If x>y

Q7. **I.** $3x^2 - 25x + 52 = 0$
II. $4y^2 - 20y + 24 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If x≥y
(c) If x<y
(d) If x≤y
(e) If x>y

Q8. I. $6x^2 - 11x - 21 = 0$
II. $5y^2 - 7y - 24 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q9. I. $x^2 - 11x + 30 = 0$
II. $y = \sqrt{49}$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q10. I. $x^2 + 24x + 119 = 0$
II. $y^2 + 13y + 42 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Directions (11-15): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer.

Q11. I. $2x^2 - 26x + 80 = 0$
II. $y^2 - 17y + 72 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q12. I. $6x^2 - 13x - 44 = 0$
II. $4y^2 - 17y - 42 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q13. I. $2y^2 - y - 1 = 0$
II. $2x^2 - 4x + 2 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q14. I. $35x^2 + 4x - 63 = 0$
II. $7y^2 - 4y - 20 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Q15. I. $6x^2 + 19\sqrt{3}x + 45 = 0$
II. $y^2 + 5\sqrt{3}y + 18 = 0$
(a) If x = y or no relation can be established between x and y.
(b) If $x \geq y$
(c) If $x < y$
(d) If $x \leq y$
(e) If $x > y$

Direction (16–20): Solve the given quadratic equations and mark the correct option based on your 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.

Q16. I. $3x^2 - x - 4 = 0$
II. $3y^2 + 16y + 13 = 0$

Q17. I. $2x^2 - x - 45 = 0$
II. $3y^2 + 16y + 21 = 0$

Q18. I. $2x^2 + 20x + 32 = 0$
II. $3y^2 + 7y + 4 = 0$

Q19. I. $2x^2 - 28x + 90 = 0$
II. $3y^2 + 8y + 4 = 0$

Q20. I. $x^2 + 31x + 108 = 0$
II. $y^2 - 21y + 98 = 0$

Directions (21-24): In each of the following 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 ≥ y
(c) If x < y
(d) If x ≤ y
(e) If x = y or no relation can be established between x and y.

Q21. I. $2x^2 - 17x + 35 = 0$
II. $4y^2 - 19y + 21 = 0$

Q22. I. $x - \frac{2}{x} = \frac{2}{x}$
II. $y^2 - 2y + 1 = 0$

Q23. I. $3x^2 + 42x + 144 = 0$
II. $4y^2 - 8y = 192$

Q24. I. $x^{3/2} = 125$
II. $y^2 + 5y = 750$

Directions (25-29): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer.
(a) If x>y
(b) If x ≥y
(c) If x<y
(d) If x ≤y
(e) If x = y or no relation can be established between x and y

Q25. I. $6x^2 + 11x - 35 = 0$
II. $2y^2 - 9y + 10 = 0$

Q26. I. $2x^2 - 17x + 36 = 0$
II. $3y^2 - 22y + 40 = 0$

Q27. I. $7x^2 + x - 8 = 0$
II. $5y^2 - 19y + 14 = 0$

Q28. I. $x^2 - 2x - 3 = 0$
II. $5y^2 - 12y - 9 = 0$

Q29. I. $6x^2 + x - 12 = 0$
II. $4y^2 + 19y + 21 = 0$

Direction (30–34): In the given questions, two quantities are given, one as 'Quantity I' and another as 'Quantity II'. You have to determine relationship between two quantities and choose the appropriate option:

Q30. The diameter of a circle is equal to the side of a square, whose perimeter is 112 cm.
Quantity I – Find the difference between area of the square and that of the circle.
Quantity II – 172 cm^2
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Q31. A table was sold at Rs 1600. If it were sold at 200 more than the profit percent will be 16% more.
Quantity I – The cost price of the table.
Quantity II – Rs. 1200
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Q32. A lent Rs 2400 and Rs Y to B and C respectively at 15% p.a. on compound interest for two years. Total amount received from C is Rs 1058 more than that of from B.
Quantity I – Find average of total amount lent by A.
Quantity II – Rs. 2800.
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Q33. 'L' meters long train crosses a 420 meters long tunnel in 30 sec running at the speed of 72 km/hr. If a man is running in opposite direction of train, & the train crosses the man in $\frac{54}{8}$ seconds.
Quantity I – Find speed of man (in km/hr).
Quantity II – 20 km/hr
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Q34. Pipe A and B alone can fill a tank in 'x' hours and 'x+10' hours respectively. Both pipes A and B together fill the same tank in 12 hours.
Quantity I – Find time taken by B alone to fill the tank is what percent of that of A alone.
Quantity II – 150%
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Directions (35-39): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer.
(a) if x>y
(b) if x<y
(c) if x ≥ y
(d) if x ≤ y
(e) if x = y or no relation can be established between x and y.

Q35. I. $x^3 \times 25 = x^2 \times 125$
II. $5y^2 + 11y - 12 = 0$

Q36. I. $6x^2 - 37x - 35 = 0$
II. $2y^2 - 32y + 126 = 0$

Q37. I. $3^{x+5} \times 9^{2x-4} = 9^{5x-14}$
II. $2y^2 - 13\sqrt{3}y + 63 = 0$

Q38. I. $x^2 - 33x + 272 = 0$
II. $\frac{6^3}{y^{\frac{3}{7}}} - \frac{72}{y^{\frac{3}{7}}} = y^{\frac{11}{7}}$

Q39. I. $2x^2 + 22x + 56 = 0$
II. $3y^2 + y - 44 = 0$

Direction (40–41): Each equation below contains a statement followed by Quantity I and Quantity II. You have to study the information along with question and compare the value derived from Quantity I and Quantity II and give the answer.

Q40. If two numbers p and q such that p > q > 0 and arithmetic mean (AM) of these two numbers is 300% more than that of geometric mean (GM) of these two numbers.
Quantity I: Find value of $\frac{(p+q)}{(p-q)}$
Quantity II: If a and b are two positive numbers and arithmetic mean (AM) & geometric mean (GM) of these two numbers is 1 and 0.8 respectively. Find the value of (a-b).
(a) Quantity I > Quantity II
(b) Quantity I < Quantity II
(c) Quantity I ≥ Quantity II
(d) Quantity I ≤ Quantity II
(e) Quantity I = Quantity II or no relation

Q41. Given, $\frac{4x-2y}{x} = \frac{7}{4}$ and x & y both are positive integers.

Quantity I: Value of $\frac{(x+y)}{2}$.

Quantity II: Value of $(y-1)$.

and choose the appropriate option

(a) Quantity I > Quantity II

(b) Quantity I < Quantity II

(c) Quantity I ≥ Quantity II

(d) Quantity I ≤ Quantity II

(e) Quantity I = Quantity II or no relation

Q42. There are two equations I and II given below. Solve these equations and answer the question.

I. $\sqrt{(50a^4 + 31a^4} + \sqrt{100}a - (64)^{\frac{1}{2}} = -4a$

II. $\sqrt[3]{64b^3} \times 2b + \sqrt{225}b + 7^2 = -3b + \sqrt{1764}$

If we multiply smallest root of equation II with 8, then which of the following statement **or statements is/are correct.**

(A) Resultant = 7 times of the smallest root of equation I

(B) Resultant + highest root of equation I = $\frac{(-11\times11)-1}{3^2}$

(C) Resultant + 10 = 200% of smallest root of equation I

(a) Only (A) and (B)

(b) Only (B) and (C)

(c) Only (A) and (C)

(d) All (A), (B) and (C)

(e) Only (C)

Direction (43-45): There are four (i), (ii), (iii) and (iv) equations given below. Solve these equations and answer the following questions.

(i) $(x \times x) - 3x - \sqrt{4x^2} = -6$

(ii) $(y^2) - \sqrt{(81y^2)} = -4 \times 5$

(iii) $\frac{z^2\sqrt{625z^6}}{5z^3} + (4 \times 7) = 39z$

(iv) $a^2 - 15a = [7 \times (-8)]$

Q43. Find the sum of difference between larger & smaller root of (iii) and product of larger & smaller root of (i).

(a) 9.2

(b) 8.2

(c) 11.2

(d) 10.2

(e) 12.2

Q44. In how many equation/s the difference between larger & smaller root is 1.
(a) Only (i) and (ii)
(b) All (i), (ii), (iii) and (iv)
(c) Only (i), (ii) and (iv)
(d) Only (ii) and (iii)
(e) Only (iii)

Q45. Find the LCM of larger roots of equation (i), (ii), (iii) and (iv).
(a) 630
(b) 840
(c) 720
(d) 160
(e) 960

Directions (46-48): Four equations i.e. I, II, III & IV are given below. You have to solve all the equations and answer the following questions.
I. $\sqrt[3]{8}\,(p \times p) - 5p - \sqrt{49} = 0$
II. $\sqrt{25}\,q^2 - \left(\sqrt{100} \times q + 2^3 \times q\right) - (7 \times 5) = 0$
III. $r^2 - \sqrt{1024}r + (11 \times 2)r = -(140\%\ of\ 15)$
IV. $(s \times s) - \frac{11\times2}{2}s + (5^2 + 3) = 0$

Q46. Find the difference between smallest root of equation IV and largest root of equation I.
(a) 4.5
(b) 1
(c) 2
(d) 1.5
(e) 0.5

Q47. Product of the largest root of equation II & IV is nearest square of which of the following number.
(i) $\sqrt[3]{216}$
(ii) L.C.M of the largest roots of equation II & III.
(iii) Half of the product of smaller roots of equation III & IV.
(a) All are correct
(b) Only (i) & (iii)
(c) Only (ii) & (iii)
(d) None of these
(e) Only (i)

Q48. If $2x\sqrt[3]{8x^3} - \sqrt[2]{441}\,x + t = 0$ (one of the roots is 3 and second root is K), then find the product of smallest root of equation II and K.
(a) 3.15
(b) −3.15
(c) 4.50
(d) −4.25
(e) 6

Directions (49–50): In each of these questions, two equation (I) and (II) are given. You have to solve both the equations and give answer.

(a) If x>y

(b) If x≥y

(c) If x<y

(d) If x≤y

(e) If x = y or no relation can be established between x and y

Q49. I. $8x^2 + 9x - 14 = 0$

II. $6y^2 - 29y + 33 = 0$

Q50. I. $7x^2 - 31x + 12 = 0$

II. $9y^2 + 45y + 26 = 0$

Solutions

S1. Ans.(e)

Sol. I. $2x^2 - 29x - 48 = 0$

$2x^2 - 32x + 3x - 48 = 0$

2x(x-16) +3 (x-16) = 0

(2x+3)(x-16)= 0

$x = 16, -1.5$

II. $3y^2 - y - 30 = 0$

$3y^2 - 10y + 9y - 30 = 0$

y(3y-10)+3(3y-10)= 0

(3y-10)(y+3)=0

$y = \frac{10}{3}, -3$

So, no relation can be established between x and y.

S2. Ans.(c)

Sol. I. $12x^2 - x - 1 = 0$

$12x^2 - 4x + 3x - 1 = 0$

$4x(3x - 1) + 1(3x - 1) = 0$

$(4x + 1)(3x - 1) = 0$

$x = -\frac{1}{4}, \frac{1}{3}$

II. $20y^2 - 41y + 20 = 0$

$20y^2 - 25y - 16y + 20 = 0$

$5y(4y - 5) - 4(4y - 5) = 0$

$(4y - 5)(5y - 4) = 0$

$y = \frac{5}{4}, \frac{4}{5}$

So, x<y

S3. Ans.(e)

Sol. I. $12x^2 - 8x - 3x + 2 = 0$

$4x(3x - 2) - 1(3x - 2) = 0$

$(4x-1)(3x-2) = 0$

$x = \frac{1}{4}, \frac{2}{3}$

II. $6y^2 - 3y - 2y + 1 = 0$

$3y(2y - 1) - 1(2y - 1) = 0$

$(3y - 1)(2y - 1) = 0$

$y = \frac{1}{3}, \frac{1}{2}$

So, no relation can be established between x & y.

S4. Ans.(b)

Sol. I. $x^2 - 11x + 30 = 0$

$x^2 - 5x - 6x - 30 = 0$

$(x - 6)(x - 5) = 0$

$\Rightarrow x = 6, 5$

II. $y^2 - 8y + 15 = 0$

$y^2 - 3y - 5y + 15 = 0$

$y(y - 3) - 5(y - 3) = 0$

$(y - 3)(y - 5) = 0$

$\Rightarrow y = 3, 5$

So, $x \geq y$

S5. Ans.(d)

Sol. I. $6x^2 + 6x + 4x + 4 = 0$

$6x(x + 1) + 4(x + 1) = 0$

$(6x+4)(x+1) = 0$

$x = -1, -\frac{2}{3}$

II. $6y^2 + 3y + 4y + 2 = 0$

$3y(2y + 1) + 2(2y + 1) = 0$

$(2y+1)(3y+2) = 0$

$y = -\frac{1}{2}, -\frac{2}{3}$

So, $x \leq y$

S6. Ans.(c)

Sol. I. $4x^2 - 24x + 32 = 0$

$4x^2 - 8x - 16x + 32 = 0$

$4x(x-2) - 16(x-2) = 0$

$(4x-16)(x-2) = 0$

$x = 4, 2$

II. $2y^2-21y+55=0$
$2y^2-10y-11y+55=0$
$2y(y-5)-11(y-5)=0$
$(2y-11)(y-5)=0$
$y = 5.5, 5$
$x<y$

S7. Ans.(e)
Sol. I. $3x^2-25x+52=0$
$3x^2-12x-13x+52=0$
$3x(x-4)-13(x-4)=0$
$(3x-13)(x-4)=0$
$x = \frac{13}{3}, 4$
II. $4y^2-20y+24=0$
$4y^2-12y-8y+24=0$
$4y(y-3)-8(y-3)=0$
$(4y-8)(y-3)=0$
$y = 2, 3$
$x>y$

S8. Ans.(a)
Sol. I. $6x^2-11x-21=0$
$6x^2-18x+7x-21=0$
$6x(x-3)+7(x-3)=0$
$(6x+7)(x-3)=0$
$x = -\frac{7}{6}, 3$
II. $5y^2-7y-24=0$
$5y^2-15y+8y-24=0$
$5y(y-3)+8(y-3)=0$
$(5y+8)(y-3)=0$
$y=-\frac{8}{5}, 3$
Can't be determined

S9. Ans.(c)
Sol. I. $x^2-11x+30=0$
$x^2-6x-5x+30=0$
$(x-6)(x-5)=0$
$x = 6, 5$
II. $y = \sqrt{49}$
$y = 7$
$x<y$

S10. Ans.(d)
Sol. I. $x^2 + 24x + 119 = 0$
$x^2 + 17x+7x + 119 = 0$
$x(x+17) + 7(x+17) = 0$
$(x+7)(x+17) = 0$
$x = -7, -17$
II. $y^2 + 13y+ 42 = 0$
$y^2+6y+ 7y+42 = 0$
$y(y+6)+7(y+6) = 0$
$(y+7)(y+6)=0$
$y = -7, -6$
Hence, $x \leq y$

S11. Ans.(d)
Sol. I. $2x^2-26x+80=0$
$2x^2-16x - 10x + 80 = 0$
$2x(x-8) - 10(x-8)= 0$
$(2x-10)(x-8)= 0$
$x = 5,8$
II. $y^2 - 17y+72=0$
$y^2-8y-9y+72 = 0$
$y(y-8)-9(y-8)=0$
$(y-8)(y-9)=0$
$y = 9,8$
$x \leq y$

S12. Ans.(a)
Sol. I. $6x^2 - 13x - 44 = 0$
$6x^2 - 24x + 11x - 44 = 0$
$6x (x-4)+ 11(x-4) = 0$
$(6x+11)(x - 4)=0$
$x = -\frac{11}{6}, 4$
II. $4y^2 -17y-42 = 0$
$4y^2 - 24y+ 7y - 42 = 0$
$4y (y-6)+7(y-6)=0$
$(4y+7)(y-6)= 0$
$y = -\frac{7}{4}, 6$
So, relationship cannot be established.

S13. Ans.(b)
Sol. I. $2y^2 -y-1=0$
$2y^2 – 2y + y-1=0$
$2y (y-1)+1(y-1)=0$
$(2y+1)(y-1)=0$
$y = -\frac{1}{2}, 1$

II. $2x^2-4x+2=0$
$2x^2-2x-2x+2=0$
$2x(x-1)-2(x-1)=0$
$(2x-2)(x-1)=0$
$x = 1, 1$
Hence, $x \geq y$

S14. Ans.(a)
Sol. I. $35x^2 + 4x - 63 = 0$
$35x^2 + 49x - 45x - 63 = 0$
$7x(5x+7)-9(5x+7)= 0$
$(7x-9)(5x+7)=0$
$x = \frac{9}{7}, -\frac{7}{5}$
II. $7y^2 - 4y - 20 = 0$
$7y^2-14y+ 10y - 20 = 0$
$7y(y-2)+10(y-2) = 0$
$(7y+10)(y-2) = 0$
$y = -\frac{10}{7}, 2$
Hence, relationship between x and y cannot be determined

S15. Ans.(e)
Sol. I. $6x^2+19\sqrt{3}x+45= 0$
$6x^2+10\sqrt{3}x + 9\sqrt{3}x+45=0$
$2x(3x+5\sqrt{3})+3\sqrt{3}(3x+5\sqrt{3})=0$
$(2x+3\sqrt{3})(3x+5\sqrt{3})=0$
$x = -\frac{3\sqrt{3}}{2}, -\frac{5\sqrt{3}}{3}$
II. $y^2+5\sqrt{3}y+18=0$
$y^2+3\sqrt{3}\,y+2\sqrt{3}\,y+18=0$
$y(y+3\sqrt{3})+ 2\sqrt{3}(y+3\sqrt{3})=0$
$(y+ 2\sqrt{3})(y+3\sqrt{3})=0$
$y =-2\sqrt{3},- 3\sqrt{3}$
Hence, $x > y$

S16. Ans.(b)
Sol. I. $3x^2 – x – 4 = 0$
$3x^2 – 4x + 3x– 4 = 0$
$x(3x-4) + 1(3x-4) = 0$
$x = -1, 4/3$
II. $3y^2 + 16y + 13 = 0$
$3y^2 + 13y +3y + 13 = 0$
$y(3y+13) + 1(3y+13) = 0$
$y = -1, -13/3$
So, $x \geq y$

S17. Ans.(e)
Sol. I. $2x^2 - x - 45 = 0$
$2x^2 - 10x + 9x - 45 = 0$
$2x(x-5) + 9(x-5) = 0$
$x = 5, -4.5$
II. $3y^2 + 16y + 21 = 0$
$3y^2 + 9y + 7y + 21 = 0$
$3y(y+3) + 7(y+3) = 0$
$y = -3, -7/3$
So, no relation

S18. Ans.(c)
Sol. I. $2x^2 + 20x + 32 = 0$
$2x^2 + 16x + 4x + 32 = 0$
$2x(x+8) + 4(x+8) = 0$
$x = -2, -8$
II. $3y^2 + 7y + 4 = 0$
$3y^2 + 3y + 4y + 4 = 0$
$3y(y+1) + 4(y+1) = 0$
$y = -1, -\frac{4}{3}$
$x<y$

S19. Ans.(a)
Sol. I. $2x^2 - 28x + 90 = 0$
$2x^2 - 18x - 10x + 90 = 0$
$2x(x-9) - 10(x-9) = 0$
$x = 5, 9$
II. $3y^2 + 8y + 4 = 0$
$3y^2 + 6y + 2y + 4 = 0$
$3y(y+2) + 2(y+2) = 0$
$y = -2, -\frac{2}{3}$
$x>y$

S20. Ans.(c)
Sol. I. $x^2 + 31x + 108 = 0$
$x^2 + 27x + 4x + 108 = 0$
$x(x+27) + 4(x+27) = 0$
$x = -4, -27$
II. $y^2 - 21y + 98 = 0$
$y^2 - 14y - 7y + 98 = 0$
$y(y-14) - 7(y-14) = 0$
$y = 7, 14$
$y>x$

S21. Ans.(a)

Sol. $2x^2 - 17x + 35 = 0$

$2x^2 - 10x - 7x + 35 = 0$

$2x(x - 5) - 7(x - 5) = 0$

$(2x - 7)(x - 5) = 0$

$x = \frac{7}{2}, 5$

II. $4y^2 - 19y + 21 = 0$

$4y^2 - 12y - 7y + 21 = 0$

$4y(y - 3) - 7(y - 3) = 0$

$(4y - 7)(y - 3) = 0$

$y = \frac{7}{4}, 3$

So, x > y

S22. Ans.(e)

Sol. I. $x = \frac{2}{x} + \frac{2}{x}$

$x^2 = 4$

$x = \pm 2$

II. $y^2 - y - y + 1 = 0$

$y(y - 1) - 1(y - 1) = 0$

$(y - 1)^2 = 0$

$y = 1,1$

So, no relation can be established.

S23. Ans.(d)

Sol. (i) $3x^2 + 42x + 144 = 0$

$\Rightarrow x^2 + 14x + 48 = 0$

$\Rightarrow x^2 + 8x + 6x + 48 = 0$

$x[x + 8] + 6[x + 8] = 0$

$[x + 8][x + 6] = 0$

$\Rightarrow x = -6, -8$

(ii) $4y^2 - 8y = 192$

$y^2 - 2y - 48 = 0$

$y^2 - 8y + 6y - 48 = 0$

$y[y - 8] + 6[y - 8] = 0$

$[y - 8][y + 6] = 0$

$\Rightarrow y = 8, -6$

$y \geq x$

S24. Ans.(b)

Sol. II. $x^{\frac{3}{2}} = 125$

$\Rightarrow x = 25$

II. $y^2 + 5y - 750 = 0$

$y^2 + 30y - 25y - 750 = 0$

$y = -30, 25$

$x \geq y$

S25. Ans.(c)

Sol. (I)$6x^2 + 11x - 35 = 0$

$6x^2 + 21x - 10x - 35 = 0$

$3x(2x + 7) - 5(2x + 7) = 0$

$(3x - 5)(2x + 7) = 0$

$x = \frac{5}{3}, -\frac{7}{2}$

(II)$2y^2 - 9y + 10 = 0$

$2y^2 - 5y - 4y + 10 = 0$

$y(2y - 5) - 2(2y - 5) = 0$

$(y - 2)(2y - 5) = 0$

$y = 2, \frac{5}{2}$

So, $x < y$

S26. Ans.(b)

Sol. I. $2x^2 - 17x + 36 = 0$

$2x^2 - 8x - 9x + 36 = 0$

$2x(x - 4) - 9(x - 4) = 0$

$(2x - 9)(x - 4) = 0$

$x = \frac{9}{2}, 4$

II. $3y^2 - 22y + 40 = 0$

$3y^2 - 12y - 10y + 40 = 0$

$3y(y - 4) - 10(y - 4) = 0$

$(y - 4)(3y - 10) = 0$

$y = 4, \frac{10}{3}$

So, $x \geq y$

S27. Ans.(d)

Sol. I. $7x^2 + x - 8 = 0$

$7x^2 + 8x - 7x - 8 = 0$

$x(7x + 8) - 1(7x + 8) = 0$

$(7x + 8)(x - 1) = 0$

$x = -\frac{8}{7}, 1$

II. $5y^2 - 19y + 14 = 0$

$5y^2 - 5y - 14y + 14 = 0$

$5y(y - 1) - 14(y - 1) = 0$

$(5y - 14)(y - 1) = 0$

$y = \frac{14}{5}, 1$

So, $x \leq y$

S28. Ans.(e)

Sol. I. $x^2 - 2x - 3 = 0$

$x^2 - 3x + 1x - 3 = 0$

$x(x - 3) + 1(x - 3) = 0$

$(x - 3)(x + 1) = 0$

$x = 3, -1$

II. $5y^2 - 12y - 9 = 0$

$5y^2 - 15y + 3y - 9 = 0$

$5y(y - 3) + 3(y - 3) = 0$

$(5y + 3)(y - 3) = 0$

$y = 3, -\frac{3}{5}$

So, No relation

S29. Ans.(a)

Sol. I. $6x^2 + x - 12 = 0$

$6x^2 + 9x - 8x - 12 = 0$

$3x(2x + 3) - 4(2x + 3) = 0$

$(2x + 3)\ (3x - 4) = 0$

$x = -\frac{3}{2}, \frac{4}{3}$

II. $4y^2 + 19y + 21 = 0$

$4y^2 + 12y + 7y + 21 = 0$

$4y(y + 3) + 7(y + 3) = 0$

$(y + 3)(4y + 7) = 0$

$y = -3, -\frac{7}{4}$

So, $x > y$

S30. Ans.(b)

Sol. Diameter of the circle (2r)=$\frac{112}{4} = 28\ cm$

Area of the square= 784 cm^2

Area of the circle=πr^2=616 cm^2

Quantity I – Required difference=168 cm^2

Quantity II – 172 cm^2

So, Quantity I < Quantity II

S31. Ans.(a)

Sol. Let the cost price of the table be Rs x

ATQ

$\frac{1600-x}{x} \times 100 + 16 = \frac{1800-x}{x} \times 100$

$x = 1250$

Quantity I – Rs. 1250

Quantity II – Rs. 1200

So, Quantity I > Quantity II

S32. Ans.(e)

Sol. Equivalent interest received in two years at 15% p.a. on CI $= 15 + 15 + \frac{15\times15}{100} = 32.25\%$

Amount received from B= $2400 \times \frac{132.25}{100} = Rs\ 3174$

Amount received from C=$Y \times \frac{132.25}{100} = Rs\ 1.3225Y$

ATQ

1.3225Y – 3174 = 1058

$\Rightarrow Y = Rs\ 3200$

Quantity I – Required average = $\frac{2400+3200}{2}$ = Rs. 2800

Quantity II – Rs. 2800

So, Quantity I = Quantity II

S33. Ans.(a)

Sol. ATQ –

$72 \times \frac{5}{18} = \frac{L+420}{30}$

L = 600 – 420

L = 180 meters

Let speed of man = s km/hr

$(72 + s) \times \frac{5}{18} = \frac{180\times8}{54}$

360 + 5s = 480

5s = 120

s = 24 km/hr

Quantity I – Speed of man = 24 km/hr

Quantity II – 20 km/hr

So, Quantity I > Quantity II

S34. Ans.(e)

Sol. ATQ

$\frac{x\times(x+10)}{x+(x+10)} = 12$

$x = 20$ hours

Quantity I – Required percentage = 150%

Quantity II – 150%

So, Quantity I = Quantity II

S35. Ans.(e)

Sol. I. $x^3 \times 25 = x^2 \times 125$

$x^3 \times 25 - x^2 \times 125 = 0$

$25x^2(x - 5)=0$

x = 0, 5

II. $5y^2 + 11y - 12 = 0$

$5y^2 + 15y - 4y - 12 = 0$

5y(y+3) -4(y+3)= 0

(5y-4)(y+3)= 0

$y = -3, \frac{4}{5}$

No relation can be established between x and y

S36. Ans.(d)

Sol. I. $6x^2 - 37x - 35 = 0$

$6x^2 - 42x + 5x - 35 = 0$

$6x(x-7) + 5(x-7) = 0$

$(6x+5)(x-7) = 0$

$x = 7, -\frac{5}{6}$

II. $2y^2 - 32y + 126 = 0$

$2y^2 - 14y - 18y + 126 = 0$

$2y(y-7) - 18(y-7) = 0$

$(2y-18)(y-7) = 0$

$y = 9, 7$

$x \leq y$

S37. Ans.(b)

Sol. I. $3^{x+5} \times 9^{2x-4} = 9^{5x-14}$

$3^{x+5} \times 3^{4x-8} = 3^{10x-28}$

On comparing powers

$x + 5 + (4x-8) = 10x - 28$

$5x - 3 = 10x - 28$

$5x = 25$

$x = 5$

II. $2y^2 - 13\sqrt{3}\,y + 63 = 0$

$2y^2 - 6\sqrt{3}\,y - 7\sqrt{3}\,y + 63 = 0$

$2y(y-3\sqrt{3}) - 7\sqrt{3}(y-3\sqrt{3}) = 0$

$(y-3\sqrt{3})(2y-7\sqrt{3}) = 0$

$y = 3\sqrt{3}, \frac{7\sqrt{3}}{2}$

$x < y$

S38. Ans.(a)

Sol. I. $x^2 - 33x + 272 = 0$

$x^2 - 17x - 16x + 272 = 0$

$(x-17)(x-16) = 0$

$x = 17, 16$

II. $\frac{6^3}{y^{\frac{3}{7}}} - \frac{72}{y^{\frac{3}{7}}} = y^{\frac{11}{7}}$

$\frac{216-72}{y^{\frac{3}{7}}} = y^{\frac{11}{7}}$

$y^2 = 144$

$y = +12, -12$

$x > y$

S39. Ans.(d)

Sol. I. $2x^2 + 22x + 56 = 0$

$x^2 + 11x + 28 = 0$

$x^2 + 7x + 4x + 28 = 0$

$x(x+7)+4(x+7)= 0$

$(x+4)(x+7)=0$

$x = -4, -7$

II. $3y^2 + y - 44 = 0$

$3y^2 + 12y – 11y - 44 = 0$

$3y(y+4) -11(y+4)= 0$

$(3y-11)(y+4)=0$

$y = \frac{11}{3}, -4$

$x \leq y$

S40. Ans.(b)

Arithmetic mean (AM) of these two numbers = $\frac{p+q}{2}$

Geometric mean (GM) of these two numbers = $\sqrt{pq}$

ATQ –

$AM = \frac{400}{100} \times GM$

$AM = 4GM$

$\frac{p+q}{2} = 4\sqrt{pq}$

$p + q = 8\sqrt{pq}$

Quantity I: Squaring both side

$(p+q)^2 = 64pq$

We know $(a+b)^2 – (a-b)^2 = 4ab$

So, $(p-q)^2 = 64pq – 4pq$

$(p-q) = \sqrt{60pq}$

So, $\frac{(p+q)}{(p-q)} = \frac{\sqrt{64pq}}{\sqrt{60pq}} = 1.03$

Quantity II: given $\frac{a+b}{2} = 1$

$a + b = 2$ ------(i)

And, $\sqrt{ab} = 0.8$

$ab = 0.64$ ---- (ii)

We know $(a+b)^2 – (a-b)^2 = 4ab$

$4 – (a-b)^2 = 4 \times 0.64$

$(a – b)^2 = 4 – 2.56$

$(a – b)^2 = 1.44$

$a – b = 1.2$

So, **Quantity I < Quantity II**

S41. Ans.(e)

Sol. 16x – 8y = 7x

8y = 9x

$\frac{y}{x} = \frac{9}{8}$

Let y and x be 9n and 8n respectively

Quantity I: Value of $\frac{(x+y)}{2} = \frac{(9n+8n)}{2} = \frac{17n}{2} = 8.5n$

Quantity II: Value of $(y-1) = (9n-1)$

if we take, n = 1 then 8.5n > (9n-1)

if we take, n=2 then 8.5n = (9n-1)

if we take, n=3 then 8.5n < (9n-1)

S42. Ans.(d)

Sol. I. $\sqrt{81a^4} + \sqrt{100}a - (8^2)^{\frac{1}{2}} = -4a$

$9a^2 + 10a - 8 = -4a$

$9a^2 + 14a - 8 = 0$

$9a^2 + 18a - 4a - 8 = 0$

$9a(a+2) - 4(a+2) = 0$

$(9a-4)(a+2) = 0$

$a = \frac{4}{9}, -2$

II. $4b \times 2b + 15b + 49 + 3b - 42 = 0$

$8b^2 + 18b + 7 = 0$

$8b^2 + 14b + 4b + 7 = 0$

$2b(4b + 7) + 1(4b + 7) = 0$

$(2b + 1)(4b + 7) = 0$

$b = -\frac{1}{2} \& -\frac{7}{4}$

Smallest root of equation II = $-\frac{7}{4}$

So, resultant = $-\frac{7}{4} \times 8 = -14$

(A) $-14 = 7 \times -2$

$-14 = -14$

So, (A) is correct

(B) $-14 + \frac{4}{9} = \frac{-121-1}{9}$

$\frac{-122}{9} = \frac{-122}{9}$

So, (B) is correct

(C) $-14 + 10 = \frac{200}{100} \times -2$

$-4 = -4$

So, (C) is correct

All (A), (B) and (C) are correct

Solutions (43-45):

(i). $x^2 - 3x - 2x + 6 = 0$

$x^2 - 5x + 6 = 0$

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

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

$x = 2, 3$

(ii). $y^2 - 9y + 20 = 0$

$y(y - 4) - 5(y - 4) = 0$

$(y - 4)(y - 5) = 0$

$y = 4, 5$

(iii). $\frac{z^2(25z^3)}{5z^3} - 39z + 28 = 0$

$5z^2 - 39z + 28 = 0$

$5z^2 - 35z - 4z + 28 = 0$

$5z(z - 7) - 4(z - 7) = 0$

$z = \frac{4}{5}, 7$

(iv). $a^2 - 15a + 56 = 0$

$a(a - 7) - 8(a - 7) = 0$

$(a - 7)(a - 8) = 0$

$a = 7, 8$

S43. Ans.(e)

Sol. Required sum = $(7 - \frac{4}{5}) + (3 \times 2) = 6.2 + 6 = 12.2$

S44. Ans.(c)

Sol. Only in equation (i), (ii) and (iv) the difference between larger & smaller root is 1.

S45. Ans.(b)

Sol. Larger roots of equation (i), (ii), (iii) and (iv) are 3, 5, 7 & 8 respectively

So, required LCM = $3 \times 5 \times 7 \times 8 = 840$

Solutions (46-48):

I. $\sqrt[3]{8}\ (p \times p) - 5p - \sqrt{49} = 0$

$2p^2 - 5p - 7 = 0$

$2p^2 - 7p + 2p - 7 = 0$

$p(2p - 7) + 1(2p - 7) = 0$

$(p + 1)(2p - 7) = 0$

$p = -1, \frac{7}{2}$

$p = -1, 3.5$

II. $\sqrt{25}\,q^2 - \left(\sqrt{100} \times q + 2^3 \times q\right) - (7 \times 5) = 0$

$5q^2 - 18q - 35 = 0$

$5q^2 - 25q + 7q - 35 = 0$

$5q(q-5) + 7(q-5) = 0$

$(5q+7)(q-5) = 0$

$q = -\frac{7}{5}, 5$

$q = -1.4, 5$

III. $r^2 - \sqrt{1024}r + (11 \times 2)r = -(140\%\ of\ 15)$

$r^2 - 32r + 22r = -21$

$r^2 - 10r + 21 = 0$

$r = 3,7$

IV. $(s \times s) - \frac{11\times2}{2}s + (5^2 + 3) = 0$

$s^2 - 11s + 28 = 0$

$s = 4, 7$

S46. Ans.(e)

Sol. Req. difference = $4 - 3.5 = 0.5$

S47. Ans.(b)

Sol. Product of the larger root of equation II & IV = $5 \times 7 = 35$

Nearest square = $\sqrt{36} = 6$

From (i) $\sqrt[3]{216} = 6$

So, (i) is follow

From (ii)

L.C.M of the larger roots of equation II & III = $5\times7 = 35$

So, (ii) is not follow

From (iii)

Half of the product of smaller roots of equation III & IV.

$= \frac{3\times4}{2} = 6$

So, (iii) is follow

S48. Ans.(b)

Sol. $2x\sqrt[3]{8x^3} - \sqrt[2]{441}x + t = 0$

$2x \times 2x - 21x + t = 0$

$4x^2 - 21x + t = 0$ .....(A)

x = 3

$4 \times 9 - 21 \times 3 + t = 0$

$36 - 63 + t = 0$

$t = 27$

Putting value of t in (A)

$4x^2 - 21x + 27 = 0$

$4x^2 - 12x - 9x + 27 = 0$

$x = 3, \frac{9}{4}$

k= $\frac{9}{4}$

Req. value = $-1.4 \times \frac{9}{4} = -3.15$

S49. Ans.(c)

Sol. I. $8x^2 + 16x - 7x - 14 = 0$

$8x(x + 2) - 7(x + 2) = 0$

$x = \frac{7}{8}, -2$

II. $6y^2 - 18y - 11y + 33 = 0$

$6y(y - 3) - 11(y - 3) = 0$

$y = \frac{11}{6}, 3$

So, x<y

S50. Ans.(a)

Sol. I. $7x^2 - 28x - 3x + 12 = 0$

$7x(x - 4) - 3(x - 4) = 0$

$x = 4, \frac{3}{7}$

II. $9y^2 + 39y + 6y + 26 = 0$

$3y(3y + 13) + 2(3y + 13) = 0$

$y = -\frac{13}{3}, -\frac{2}{3}$

So, x>y