

Quiz Date: 18th March 2020

Directions (1-5): Solve the given quadratic equations and mark the correct option based on your answer—

- (a) $x < y$
- (b) $x \leq y$
- (c) $x = y$ or no relation can be established between x and y .
- (d) $x > y$
- (e) $x \geq y$

Q1. I. $x^2 - 4x - 1152 = 0$
II. $y^2 + 65y + 1056 = 0$

Q2. I. $5x^2 + 31x + 48 = 0$
II. $3y^2 + 27y + 42 = 0$

Q3. I. $3x + 7y = 40$
II. $42x + 21y = 200$

Q4. I. $12x^2 + 109x + 240 = 0$
II. $9y^2 + 99y + 272 = 0$

Q5. I. $4x^2 - 33x + 63 = 0$
II. $10y^2 - 113y + 318 = 0$

Directions (6-10): 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 (compare only magnitudes)

Q6. **Quantity I- 'Area of rectangle'** Sum of circumference of circle and perimeter of rectangle is 220 cm. and area of circle is $1386 \frac{1}{3}\%$ more than radius of circle.

Quantity II- 'Perimeter of square' Circumference of a circle is 132 cm and area of circle is 710 sq. cm more than area of square

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I \geq Quantity II
- (d) Quantity I \leq Quantity II
- (e) Quantity I = Quantity II or no relation

Q7. **Quantity I** - Veer takes two times more than the time taken by Sameer to complete a work. Sameer and veer started to work alternatively starting with Sameer on first day and Veer on second day. If both completed work in 36 days, then find in how many days Sameer and Veer will complete the work together, if both work with their double efficiency?

Quantity II – Tap P can fill a swimming pool in 8 days and tap Q can fill the same swimming pool in 24 days, while tap R can empty the swimming pool in 16 days. If all three taps are opened together in swimming pool, then in how much time swimming pool will filled completely?

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I \geq Quantity II
- (d) Quantity I \leq Quantity II
- (e) Quantity I = Quantity II or no relation



Q8. The length of a passenger train moving at a speed of 45km/h is 250m. The length of a Rajdhani train is 750m which can move at a maximum speed of 135km/h.

Quantity I: Time taken by the passenger train to cross a person standing on the platform.

Quantity II: Time taken by the passenger train to cross the Rajdhani train coming from opposite direction.

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I \geq Quantity II
- (d) Quantity I \leq Quantity II
- (e) Quantity I = Quantity II or No relation

Q9. There are 3 vessels A, B and C full of mixture of milk and water. Vessel A contains 5 liters of water and 25 liters of milk, Vessel B contains 15 liters of water and 30 liters of milk and Vessel C contains water and milk in the ratio 1 : 5. 20%, 40% and 30% of the total mixtures from vessels A, B and C respectively is taken and poured into a fourth vessel. The ratio of milk and water in the fourth vessel is 16 : 5.

Quantity I: Capacity of vessel C in litres.

Quantity II: 80 litres.

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I \geq Quantity II
- (d) Quantity I \leq Quantity II
- (e) Quantity I = Quantity II or No relation

Q10. P, Q and R can complete a piece of work in 8, 12 and 24 days respectively. They work on alternate days.

Quantity I: Time taken by them to complete the work if P works on day 1, Q works on day 2 and R works on day 3 and so on.

Quantity II: Time taken by them to complete the work if Q works on day 1, R works on day 2 and P works on day 3 and so on.

- (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 (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. $2x^4 \times \frac{1}{(x^4)^{0.5}} + 10x - 72 = 0$

II. $5y^2 + 14y - 96 = 0$

Q12.

I. $x^2 + 2x - 675 = 0$

II. $y^2 + 6y - 567 = 0$

Q13.

I. $18x^2 - 15x + 3 = 0$

II. $24y^2 + 20y - 4 = 0$

Q14.

I. $5x = \sqrt[3]{4096}$

II. $\sqrt[3]{\frac{6y}{729}} = \sqrt{9}$

Q15.

I. $5x^2 + 663x + 396 = 0$

II. $y^2 + 44y + 483 = 0$

Solutions

S1. Ans.(e)

Sol.

I. $x^2 - 4x - 1152 = 0$

$x^2 - 36x + 32x - 1152 = 0$

$$(x - 36)(x + 32) = 0$$

$$x = 36, -32$$

$$\text{II. } y^2 + 65y + 1056 = 0$$

$$y^2 + 33y + 32y + 1056 = 0$$

$$(y + 33)(y + 32) = 0$$

$$y = -33, -32$$

$$\therefore x \geq y$$



S2. Ans.(c)

Sol.

$$\text{I. } 5x^2 + 31x + 48 = 0$$

$$5x^2 + 15x + 16x + 48 = 0$$

$$(x + 3)(5x + 16) = 0$$

$$x = -3, \frac{-16}{5}$$

$$\text{II. } 3y^2 + 27y + 42 = 0$$

$$3y^2 + 21y + 6y + 42 = 0$$

$$(y + 7)(3y + 6) = 0$$

$$y = -7, -2$$

\therefore No relation

S3. Ans.(a)

Sol.

$$\text{I. } 3x + 7y = 40$$

$$\text{II. } 42x + 21y = 200$$

Solving (i) & (ii)

$$x = \frac{80}{33} \text{ \& } y = \frac{360}{77}$$

$$y > x$$

S4. Ans.(e)

Sol.

$$\text{I. } 12x^2 + 109x + 240 = 0$$

$$12x^2 + 64x + 45x + 240 = 0$$

$$(3x + 16)(4x + 15) = 0$$

$$x = -\frac{16}{3}, -\frac{15}{4}$$



$$\text{II. } 9y^2 + 99y + 272 = 0$$

$$9y^2 + 51y + 48y + 272 = 0$$

$$(3y + 17)(3y + 16) = 0$$

$$y = -\frac{16}{3}, -\frac{17}{3}$$

$$x \geq y$$

S5. Ans.(a)

Sol.

$$4x^2 - 33x + 63 = 0$$

$$4x^2 - 12x - 21x + 63 = 0$$

$$4x(x - 3) - 21(x - 3) = 0$$

$$x = 3, \frac{21}{4}$$

$$\therefore 10y^2 - 113y + 318 = 0$$

$$10y^2 - 60y - 53y + 318 = 0$$

$$10y(y - 6) - 53(y - 6) = 0$$

$$y = 6, \frac{53}{10}$$

$$y > x$$

S6. Ans(a)

Sol. **Quantity I -**

$$2\pi r + 2(\ell + b) = 220 \text{ cm}$$

$$\pi r^2 = 1386 \text{ sq. cm}$$

$$r^2 = \frac{1386 \times 7}{22}$$

$$r = 21 \text{ cm}$$

Length of rectangle

$$= 21 \times \frac{4}{3} = 28 \text{ cm}$$

$$2 \times \frac{22}{7} \times 21 + 2(28 + b) = 220$$

$$132 + 56 + 2b = 220$$

$$b = \frac{32}{2} = 16 \text{ cm}$$

$$\text{Area of rectangle} = (28 \times 16) = 448 \text{ cm}$$

Quantity II -

$$2\pi r = 132$$

$$r = \frac{132 \times 7}{2 \times 22}$$

$$r = 21 \text{ cm}$$

$$\pi r^2 - a^2 = 710$$

$$\frac{22}{7} \times 21 \times 21 - a^2 = 710$$

$$a^2 = 1386 - 710$$

$$a^2 = 676 \text{ cm}$$

$$a = 26 \text{ cm}$$

$$\text{Perimeter of square} = 4 \times 26 = 104 \text{ cm}$$

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Quantity I > Quantity II

S7. Ans.(b)

Sol.

Quantity I—Let Veer take $3x$ days and Sameer take x days.Efficiency of Veer and Sameer be x unit/day and $3x$ units/day respectivelyTotal work = $3x \times 18 + x \times 18$ $= 72x$ units

If both do with double efficiency

Then,

$$= \frac{72x}{(3x \times 2 + 2x)}$$

 $= 9$ days**Quantity II—**

| Taps | Time | Capacity (unit) | Efficiency |
|------|------|--------------------|---------------|
| P | 8 | 48 | 6 unit/day |
| Q | 24 | | 2 unit/day |
| R | 16 | | (-3) unit/day |

When all three opened together

Total work in one day = $(6 + 2 - 3) = 5$ unitsRequired time = $\frac{48}{5} = 9\frac{3}{5}$ days**Quantity I < Quantity II**

S8. Ans.(d)

Sol. **Quantity I:**Time taken to cross the person = $\frac{\text{Length of train}}{\text{Speed of train}}$

$$= \frac{250}{45 \times \frac{5}{18}}$$

 $= 20$ sec**Quantity II:**

Minimum time taken to cross the Rajdhani train

$$= \frac{\text{Sum of lengths of trains}}{\text{Maximum sum of speeds of trains}}$$



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$$= \frac{250 + 750}{(45 + 135) \times \frac{5}{18}} = 20 \text{ sec}$$

∴ Time ≥ 20 sec

Quantity II ≥ Quantity I

S9. Ans.(b)

Sol. **Quantity I:**

Let the quantity of water and milk in the vessel C be x and 5x liters respectively

And, capacity of vessel C be 6x litres.

$$\frac{\text{Quantity of water in fourth vessels}}{\text{Quantity of milk in fourth vessels}} = \frac{5}{16}$$

$$\Rightarrow \frac{20\% \text{ of } 5 + 40\% \text{ of } 15 + 30\% \text{ of } x}{20\% \text{ of } 25 + 40\% \text{ of } 30 + 30\% \text{ of } 5x} = \frac{5}{16}$$

$$\Rightarrow x = 10$$

Capacity of vessel C = 6x = 60 litres

Quantity II > Quantity I

S10. Ans.(e)

Sol. Let, total units of work be 48 units

Then,

P does 6 units per day.

Q does 4 units per day.

R does 2 units per day.

3 days' work of P, Q and R working alternately = 6 + 4 + 2 = 12 units

12 days' work = $12 \times \frac{12}{3} = 48$ units

No work left after 4 rotations (12 days), so the work will be completed in same number of days (12 days) and doesn't depend on the sequence they work.

Quantity I = quantity II

S11. Ans.(e)

Sol. (I) $2x^4 \times x^{-2} + 10x - 72 = 0$

$$2x^2 + 10x - 72 = 0$$

$$x^2 + 5x - 36 = 0$$

$$x^2 + 9x - 4x - 36 = 0$$

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

$$x = -9, 4$$

$$\text{(II) } 5y^2 + 14y - 96 = 0$$

$$5y^2 + 30y - 16y - 96 = 0$$

$$5y(y + 6) - 16(y + 6) = 0$$

$$y = \frac{16}{5}, -6$$

No relation can be established between x and y.

S12. Ans.(e)

$$\text{Sol. (I) } x^2 + 27x - 25x - 675 = 0$$

$$x(x + 27) - 25(x + 27) = 0$$

$$x = 25, -27$$

$$(II) y^2 + 27y - 21y - 567 = 0$$

$$y(y + 27) - 21(y + 27) = 0$$

$$y = 21, -27$$

No relation can be established between x and y.

S13. Ans.(a)

$$\text{Sol. (I)} 18x^2 - 9x - 6x + 3 = 0$$

$$9x(2x - 1) - 3(2x - 1) = 0$$

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

$$(II) 24y^2 + 24y - 4y - 4 = 0$$

$$24y(y+1) - 4(y+1) = 0$$

$$y = -1, \frac{1}{6}$$

$$x > y$$

S14. Ans.(c)

Sol.

$$I. 5x = \frac{\sqrt[3]{4096}}{5}$$

$$x = \frac{16}{5}$$

$$x = 3.2$$

$$II. 6y = \sqrt{9} \times \sqrt[3]{729}$$

$$y = \frac{3 \times 9}{6}$$

$$y = 4.5$$

$$x < y$$

S15. Ans.(e)

Sol.

$$I. 5x^2 + 663x + 396 = 0$$

$$5x^2 + 660x + 3x + 396 = 0$$

$$5x(x + 132) + 3(x + 132) = 0$$

$$(5x + 3)(x + 132) = 0$$

$$x = \frac{-3}{5}, -132$$

$$II. y^2 + 44y + 483 = 0$$

$$y^2 + 21y + 23y + 483 = 0$$

$$y(y + 21) + 23(y + 21) = 0$$

$$(y + 21)(y + 23) = 0$$

$$y = -21, -23$$

No relation can be established between x and y.



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