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Maths Inequalities Questions for Bank and Insurance Exams

Maths inequalities Quiz 10

Directions: In each of the following questions, read the given statement and compare the Quantity I and Quantity II on its basis. (Only quantity is to be considered)

1).

Quantity I: A sum of money under simple interest becomes 5 times of itself in x years but it becomes 9 times of itself in $x^2/2$ years. What is the value of x ?

Quantity II: 3.5 years

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

2).

Quantity I: In the given figure, ABCD is a rectangle with dimensions 8 cm and 6 cm. What is the sum of the area of the triangle ADE and the triangle BCE?

Quantity II: 25 sq. cm

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

3). **The ratio of boys to girls in a school is 4: 5. If 45 students from the same school left in the same ratio and 40 new girls joined the school, then the ratio of boys to girls becomes 4:9.**

Quantity I: What percentage of total students will be boys if 50% of the total number of boys leave the school?

Quantity II: 30%

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

4). In a race of 500 meters, A beats B by 50 meters but in a race of 1 km, B beats C by 250 meters.

Quantity I: In a race of 800 meters, by how much distance will A beat C?

Quantity II: 250 meters

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

5). The compound interest received on Rs. 5000 at x% per annum at the end of 2 years is equal to the simple interest received in four years on Rs. 2650 at the same rate of interest.

Quantity I: What is the total simple interest received?

Quantity II: Rs. 1275

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

6). An inlet pipe A can completely fill a water tank of 25000 litres capacity in 10 hours but an outlet pipe B can empty the completely filled tank in 40 hours.

Quantity I: In how many hours pipe A and Pipe B together will fill half of the tank?

Quantity II: In how many hours pipe A alone fill 70% of the capacity of the tank?

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

7). The ratio of males to females in a town is 5: 4. If 5000 females got married and moved to another town then the ratio of males to females become 7: 4.

Quantity I: What is the total number of male populations in the town?

Quantity II: 21750

- A. Quantity: I > Quantity: II B. Quantity: I \geq Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II \geq Quantity: I E. Quantity I = Quantity II or relation can't be established

8). The average age of five members of a family is X years. The average age of any of the distinct pair of five members of the family is Y years.

Quantity I: x

Quantity II: y

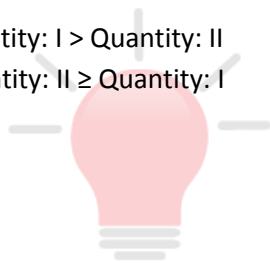
- A. Quantity: I > Quantity: II B. Quantity: I ≥ Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II ≥ Quantity: I E. Quantity I = Quantity II or relation can't be established

9). A train of length 'x' metres running at the speed of 15 km per hour takes 40 seconds to cross a man walking in the opposite direction at the speed of 7.5 km per hour but it takes 2 minutes to cross a platform of length 'y' meters.

Quantity I: What is the length of the train?

Quantity II: What is the length of the platform?

- A. Quantity: I > Quantity: II B. Quantity: I ≥ Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II ≥ Quantity: I E. Quantity I = Quantity II or relation can't be established



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10).

Quantity I: Two pipes P and Q can fill a water tank in 15 minutes and 20 minutes respectively. If both were opened simultaneously then after how many minutes should pipe Q be closed so the tank will be filled in 12 minutes?

Quantity II: 5 minutes

- A. Quantity: I > Quantity: II B. Quantity: I ≥ Quantity: II C. Quantity: I < Quantity: II
D. Quantity: II ≥ Quantity: I E. Quantity I = Quantity II or relation can't be established

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Correct Answers:

1	2	3	4	5	6	7	8	9	10
A	C	C	A	C	C	A	E	E	C

Explanations:

1. Quantity I:

Let the sum of money was P and rate of interest is R then we know that SI

$$= \frac{P \times R \times T}{100}$$

$$\text{SI in } x \text{ years} = 5P - P = 4P$$

$$4P = \frac{P \times R \times x}{100} \dots\dots\dots(i)$$

$$\text{SI in } x^2/2 \text{ years} = 9P - P = 8P$$

$$8P = \frac{P \times R \times x^2}{2 \times 100} \dots\dots\dots(ii)$$

Divide equation (i) to equation (ii)

$$\frac{4}{8} = \frac{2}{x}$$

$$x = 4 \text{ years}$$

Quantity II : 3.5 years

Therefore, Quantity I > Quantity II

Hence, option A is correct.

2. Quantity I : We know that, in rectangle, if the base of triangle is same then the area of the triangle is half of the area of the rectangle

$$\text{The area of the triangle DEC} = \frac{1 \times 6 \times 8}{2} = 24. \text{ Sq. cm.}$$

therefore, the sum of the area of the triangle ADE and the triangle BCE = area of the

rectangle – area of the triangle DEC = $6 \times 8 - 24 = 48 - 24 = 24$ sq. cm (area of the rectangle = length \times breadth)

Quantity II: 25 sq. cm

Therefore, Quantity I < Quantity II

Hence, option C is correct.

3. Let the number of boys = $4x$ and the number of girls = $5x$
If 45 students from the same school leave the school

$$\text{Then the number of boys left} = \frac{45 \times 4}{9} = 20$$

$$\text{Then the number of girls left} = \frac{45 \times 5}{9} = 25$$

According to the question,

$$\frac{4x - 20}{5x - 25 + 40} = \frac{4}{9} \Rightarrow \frac{4x - 20}{5x + 15} = \frac{4}{9}$$

$$36x - 180 = 20x + 60$$

$$16x = 240$$

$$x = 15$$

$$\text{the number of boys} = 4x = 4 \times 15 = 60$$

$$\text{and the number of girls} = 5x = 5 \times 15 = 75$$

$$\text{When, 50\% of the boys left then the remaining number of boys} = 50\% \text{ of } 60 = 30$$

$$\text{Total students} = 30 + 75 = 105$$

$$\text{Reqd. \%} = \frac{30 \times 100}{105} = 28.57\% \text{ approximately}$$

Therefore, Quantity : I < Quantity : II

Hence, option C is correct.

4. Case 1,

When A goes for 500 meters B goes for 450 meters

$$A : B = 500 : 450 = 10 : 9$$

Case 2,

When B goes for 1000 meters, C goes for 750 meters

$$B : C = 1000 : 750 = 4 : 3$$

$$A : B : C = 40 : 36 : 27$$

Quantity I: When A travels $40x$ meters C travels $27x$ meters

When A travels $40 \times 20 = 800$ meters

C will travel $27 \times 20 = 540$ meters

It means, A will beat C by $800 - 540 = 260$ meters

Therefore, Quantity I > Quantity II

Hence, option A is correct.

5. Let the rate of interest = $r\%$ per annum then

$$5000 \left(1 + \frac{r}{100}\right)^2 - 5000 = \frac{2650 \times 4 \times r}{100}$$

$$5000(1 + 0.01r)^2 - 5000 = 106r$$

$$5000(1 + 0.0001r^2 + 0.02r) - 5000 = 106r$$

$$5000 + 0.5r^2 + 100r - 5000 = 106r$$

$$0.5r^2 - 6r = 0$$

$$0.5r = 6$$

$$r = 12$$

$$\text{The S. I.} = \frac{2650 \times 12 \times 4}{100} = 106 \times 12 = \text{Rs. } 1272$$

So, **Quantity I** = Rs. 1272

Quantity II = Rs. 1275

Hence, option C is correct.

6.

The efficiency of inlet pipe = $\frac{25000}{10} = 2500$ litres per hour

The efficiency of outlet pipe = $\frac{25000}{40} = 625$ litres per hour

Quantity I:

Half of the tank = $\frac{25000}{2} = 12500$ litres

The efficiency of pipe A and B together = $2500 - 625 = 1875$ litres per hour

The reqd. time = $\frac{12500}{1875} = \frac{20}{3}$ hours = 6 hours 40 min.

Quantity II: 100% in 10 hours therefore, 70% in 70% of 10 = 7 hours

Therefore, Quantity : I < Quantity : II

Hence, option C is correct.

7.

Let the population of male = $5x$ then the population of female = $4x$

According to the question,

$$\frac{5x}{4x - 5000} = \frac{7}{4}$$

$$20x = 28x - 35000$$

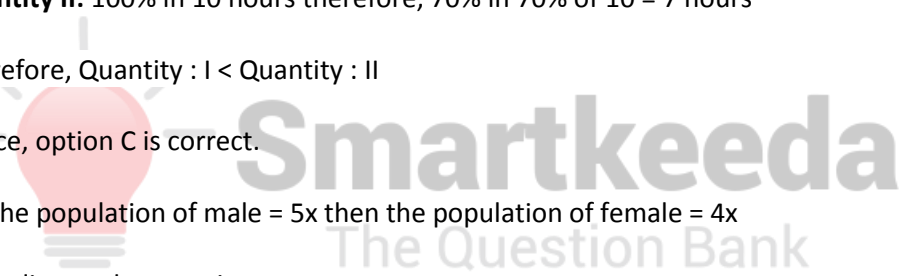
$$8x = 35000$$

$$x = 4375$$

The number of males = $5x = 5 \times 4375 = 21875$

Therefore, Quantity : I > Quantity : II

Hence, option A is correct.



8. Let the age of the members of the family, a, b, c, d, and e years

$$A + b + c + d + e = 5x \text{ years}$$

$$A + B = B + C = C + D = D + E = 2y \text{ years}$$

The average age of any of the distinct pairs are same it means the age of all the member are same then only the average of any of the distinct pairs will be same

$$A = b = c = d = e = p \text{ years}$$

$$\text{Then, } a + b + c + d + e = 5p = 5x \text{ years}$$

$$\text{Quantity I : } P = x$$

$$\text{Quantity II : } a + b = 2p = 2y$$

$$P = y$$

Therefore, Quantity : I = Quantity : II

Hence, option E is correct.

9. Relative speed of man and train = $15 + 7.5 = 22.5 \text{ km/hr} = 22.5 \times 5/18 \text{ m/sec}$

Distance = speed \times time

$$x = \frac{22.5 \times 5 \times 40}{18} = 250 \text{ meters} = \text{length of train}$$

$$\text{Quantity II : } x + y = 15 \times 120 \times 5/18$$

$$250 + y = 500$$

$$Y = 500 - 250 = 250 \text{ meters} = \text{the length of platform}$$

Therefore, Quantity I = Quantity II

Hence, option E is correct.

10. **Quantity I:** Let pipe Q was opened for x minutes then

$$\frac{12}{15} + \frac{x}{20} = 1$$

$$12 \times 4 + (x) \times 3 = 60$$

$$48 + 3x = 60$$

$$3x = 12$$

$$x = 4$$

It means, pipe Q was opened only for 4 minutes

Therefore, Quantity : I < Quantity : II

Hence, option C is correct.



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