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Maths Inequalities Questions for Bank and Insurance Exams

Maths inequalities Quiz 7

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. A motorboat can travel x km upstream and x + 20 km downstream in 17.5 hours. If the ratio of the speed of the motorboat in still water to the speed of stream is 3: 1 and the difference between their speed is 4 km.

   Quantity I: What is the value of x?
   Quantity II: How much distance the motorboat will travel downstream in 5 hours 15 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

2. Two persons, A and B together can do a piece of work in 15 days. B is 80% as efficient as A.

   Quantity I: If they work on alternate day, starting with A then how many days will they take to complete 50% of the work?
   Quantity II: How many days, B alone will take to complete 40% of the total work?

   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

3. The speed of a 500 meters long train is 5 km per hour more than that of a car. If the car and the train travel in opposite direction then the car can cross the train completely in 1.5 minutes.

   Quantity I: What is the speed of the train?
   Quantity II: What will be the speed of car when it is increased by 50%?

   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

4. In a mixture of Ghee and Dalda, the quantity of Dalda is 40% less than the quantity of Ghee. When 5 litres of pure Ghee were added then the quantity of Ghee becomes 80% more than the quantity of Dalda.

   Quantity I: What is the quantity of Dalda in the mixture?
   Quantity II: 40 litres

   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
5. On 1\textsuperscript{st} Jan 2018, the average age of a family of 5 members is 45 years. On 1\textsuperscript{st} July 2018, one of the members of the family died. On 1\textsuperscript{st} Jan 2019, the average age of the family will become 32 years.

**Quantity I:** At what age, did the person die?

**Quantity II:** 100 years

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

6. In a mixture of milk and water, the ratio of milk to water is 2 : y. When 4 litres of milk were added in the mixture then, the concentration of water becomes 50\% but when 4 litres of water were added in the mixture then the concentration of milk becomes 33.33\%.

**Quantity I:** Milk will be what part of the mixture when, 5 litres of milk were added in the original mixture?

**Quantity II:** Water will be what part of the mixture when 3 litres of water were added in the original mixture?

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

7. **Quantity I:** \(x^2 - 10\sqrt{7}x + 168 = 0\)

**Quantity II:** \(y^2 - \sqrt{6}y - 72 = 0\)

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

8. In the given rectangle, AB = 12 cm, CD = 8 cm. AF = FB and AE = ED.

**Quantity I:** What is the area of shaded region?

**Quantity II:** What is the area of unshaded region?

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. The efficiency of A is 25% more than that of B. And total work is 100 units.

**Quantity I**: Find the number of days B alone will take to complete 75% of the work?

**Quantity II**: Find the number of days A and B together will take to complete 150% of the work?

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

10. **Quantity I**: A gave one-fifth of the amount he had to B. B in turn gave half of what he received from A to C. If the difference between the remaining amount with A and the amount received by C is Rs. 700, how much money did B receive from A?

**Quantity II**: Rs 250

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
Explanations:

1. Let the speed of the motorboat in still water = 3a km/hr then the speed of the motorboat in stream = a km/hr
   According to the question, 3a – a = 2a = 4
   a = 2 km/hr
   the speed of the motorboat in still water = 3a km/hr = 6 km/hr
   the speed of the motorboat in stream = a km/hr = 2 km/hr
   Upstream speed = 6 – 2 = 4 km/hr
   Downstream speed = 6 + 2 = 8 km per hour
   \[
   \frac{x}{4} + \frac{x + 20}{8} = 17.5
   \]
   \[
   8x + 4x + 80 = 17.5 \times 32 = 560
   \]
   \[
   12x = 560 - 80 = 480
   \]
   \[
   x = 40
   \]
   
   **Quantity I:** 40
   **Quantity II:**
   
   Distance = speed \times time = \frac{8 \times 21}{4} = 42 km
   
   Therefore, Quantity I < Quantity II

   Hence, option C is correct.

2. Let A’s efficiency = 5x units then B’s efficiency = 80% of 5x = 4x
   Total work done by A and B together in 15 days = (5x + 4x) \times 15 = 9x \times 15 = 135x units
   **Quantity I:**
   
   50% of the work = \frac{135x}{2} = 67.5x
   
   First day, A will do 5x units
   2nd day, B will do 4x units
   In the first 2 days, i.e. in one cycle 5x + 4x = 9x units
   In 7 cycle i.e. 14 days 9x \times 7 = 63x units
   Remaining = 67.5x – 63x = 4.5x units
   That A will do in approximately 1 day
   Total number of days = 14 + 1 = 15 days approximately

   **Quantity II:** 40% of the work = 40% of 135x
   = 40 \times \frac{135x}{100} = 54x
B alone will take, \( \frac{54x}{4x} = 13.5 \) days

Therefore, Q1 > Q2
Hence, option A is correct.

3.

Let the speed of the car = \( x \) km per hr = \( x \times \frac{5}{18} \) m/s

The speed of the train = \( x + 5 \) km/hr = \( (x + 5) \times \frac{5}{18} \) m/s

If they travel in opposite direction then the relative speed = \( (x + x + 5) \) km per hr
= \( (2x + 5) \times \frac{5}{18} \) m/s

We know that, distance = speed \times time

\( 500 = (2x + 5) \times \frac{5}{18} \times 90 \)

\( 2x + 5 = 20 \)
\( x = 7.5 \) km per hour

**Quantity I:**
The speed of the train = \( x + 5 = 12.5 \) km per hr

**Quantity II:**
150% of 7.5 = \( \frac{150 \times 7.5}{100} = 11.25 \) km per hour

Therefore, Quantity: I > Quantity : II
Hence, option A is correct.

4.

Let the quantity of Ghee = 10x litres then the quantity of Dalda = \( (100 - 40)\% \) of 10x = 60% of 10x = 6x litres
When 5 litres of Ghee was added then the quantity of Ghee = 10x + 5 litres and the quantity of Dalda = 6x litres

According to the question,
180% of 6x = (10x + 5)
10.8x = 10x + 5
0.8x = 5
8x = 50
x = 6.25 litres

**Quantity I:**
The quantity of Dalda = 6x = 6 \times 6.25 = 37.5 litres
Therefore, Quantity : I < Quantity : II
Hence, option C is correct.
5. On 1st Jan 2018, the sum of the age of 5 members = 45 × 5 = 225 years
   On 1st Jan 2019, the sum of the age of 4 members = 32 × 4 = 128 years
   So, on 1st Jan 2018 the sum of the age of 4 members = 31 × 4 = 124 years
   So, on 1st Jan 2018 the person who died on 1st July 2018 = (225 – 124) = 101 years
   Therefore, Quantity : I > Quantity : II
   Hence, option A is correct.

6. Let the quantity of milk = 2x litres then the quantity of water = yx litres
   According to the question,
   yx = 50% of (2x + yx + 4)
   2yx = 2x + yx + 4
   yx = 2x + 4 ............ (i)
   2x = 33.33% of (2x + yx + 4)
   6x = 2x + yx + 4
   yx = 4x – 4 ............... (ii)
   From the equation (i) and (ii)
   2x + 4 = 4x – 4
   2x = 8
   x = 4
   Put the value of x in the equation (i)
   y = 3
   The quantity of milk in the original mixture = 2x = 8 litres and the quantity of water = yx = 3 × 4 = 12 litres
   Quantity I: when, 5 litres of milk were added in the original mixture
   milk = 8 + 5
   12 + 8 + 5 = 13th part
   Quantity II: when 3 litres of water were added in the original mixture
   water = 12 + 3
   12 + 8 + 3 = 15
   Therefore, Quantity : I < Quantity : II, Hence, option C is correct.

7. Quantity I:
   \[ x^2 - 10\sqrt{7}x + 168 = 0 \]
   \[ x^2 - 4\sqrt{7}x - 6\sqrt{7}x + 168 = 0 \]
   \[ x(x - 4\sqrt{7}) - 6\sqrt{7}(x - 4\sqrt{7}) = 0 \]
   \[ (x - 4\sqrt{7})(x - 6\sqrt{7}) = 0 \]
   \[ x = 4\sqrt{7}, 6\sqrt{7} \]

   Quantity II:
   \[ y^2 - 6\sqrt{6}y - 72 = 0 \]
   \[ y^2 + 3\sqrt{6}y - 4\sqrt{6}y - 72 = 0 \]
   \[ y(y + 3\sqrt{6}) - 4\sqrt{6}(y + 3\sqrt{6}) = 0 \]
   \[ (y + 3\sqrt{6})(y - 4\sqrt{6}) = 0 \]
   \[ y = -3\sqrt{6}, 4\sqrt{6} \]
   For \( x = 4\sqrt{7}, or 6\sqrt{7} \) and \( y = -3\sqrt{6}, or 4\sqrt{6} \) \( x > y \)
Therefore, $x > y$
Hence, option A is correct.

8.

AE = ED = $\frac{8}{2} = 4$ cm
AF = FB = $\frac{12}{2} = 6$ cm

Area of BFC = $\frac{1}{2} \times 8 \times 6 = 24$ sq. cm
Area of ACB = $\frac{1}{2} \times 12 \times 8 = 48$ sq. cm
Area of DEC = $\frac{1}{2} \times 12 \times 4 = 24$ sq. cm
Area of DAC = $\frac{1}{2} \times 12 \times 8 = 48$ sq. cm

Quantity I: Area of shaded region = area of DEC + area of acf = $24 + (48 - 24) = 48$ sq. cm
Quantity II: Area of unshaded region = area of rectangle − area of shaded region = $96 - 48 = 48$ sq. cm

Therefore, Quantity I = Quantity II
Hence, option E is correct.

9.
The ratio of the efficiency of A and B = 5 : 4

The total units of work = 100 units then the number of days, A will take
$= \frac{100}{5} = 20$ days

and the number of days, B will take
$= \frac{100}{4} = 25$ days

Quantity I: 75% of the work = 75% of 100 = 75 units
The number of days, B alone will take $= \frac{75}{4} = 18.75$ days

Quantity II: 150% of the work = 150 units
The number of days, A and B together will take to complete
\[ \frac{150}{5 + 4} = \frac{150}{9} = 16.67 \text{ days} \]

Therefore, Quantity I > Quantity II
Hence, option A is correct.

10. **Quantity I:**
Suppose initially A had Rs. x
Then, amount received by B = Rs. \( \frac{x}{5} \)
Amount remaining with A = Rs. \( x - \frac{x}{5} = \frac{4x}{5} \)

Amount received by C = Rs. \( \left( \frac{1}{2} \times \frac{x}{5} \right) = \frac{x}{10} \)

Since, \( \left( \frac{4x}{5} - \frac{x}{10} \right) = 700 \)
\[ \Rightarrow 7x = 700 \times 10 \]
\[ \Rightarrow x = 1000. \]

Hence, amount received by B = Rs. \( \frac{x}{5} = \text{Rs. 200} \)

**Quantity II : Rs 250**

Here we can see Quantity II is more than Quantity I,
Hence option C is right answer.
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