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Maths Inequalities Questions for Bank and Insurance Exams

Maths inequalities Quiz 3

Directions: Each question below contains a statement followed by Quantity I and Quantity II. You have to study the information along with the question and compare the value derived from Quantity I and Quantity II, then answer:

1. A 250 metres long train running at the speed of 100 kmph crosses another train running in opposite direction at the speed of 60 kmph in 9 seconds.

Quantity I: The length of the other train

Quantity II: The length of the first train shrinks by $\frac{3}{4}$ th of that of the other train

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 can be established

2. A box contains 3 Samsung phones, 4 Vivo phones and 5 Lava phones.

Quantity I: If two phones are drawn at random, the probability that both the phones are either Lava or Samsung

Quantity II: If two phones are drawn at random, the probability that both the phones are either Vivo or Lava.

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 can be established

3. The sum of the diameter and the circumference of circle A is 174 cm and the radius of circle B is 14 cm less than the radius of circle A.

Quantity I: Twice the radius of circle A

Quantity II: The circumference of circle B

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 can be established

4. Flipkart listed two headphones for Rs. 476. One of the headphones was sold at a loss of 25% and the other at a gain of 29% and the company found that each headphone was sold at the same price.

Quantity I: The cost price of the headphone which was sold at 29% profit

Quantity II: The selling price of the headphone which was sold at 25% loss

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 can be established

5. In a circle with centre O, PT and PS are tangents drawn to it from point P. If $PT = 24$ cm and $OT = 10$ cm

Quantity I: The length of PO.

Quantity II: Double the length of the hypotenuse of a right angled triangle the other two sides of which are 8 cm and 15 cm respectively.

- 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 can be established

6. The perimeter of a square is equal to twice the perimeter of a rectangle of length 13 cm and breadth 15 cm.

Quantity I: The perimeter of a semicircle whose diameter is equal to the side of the square

Quantity II: The perimeter of another semicircle whose radius is 21 cm

- 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 can be established

7. Two pipes A and B fill an empty tank in 40 minutes and 60 minutes respectively. If both pipes are opened simultaneously.

Quantity I: After what certain time A should be closed so that the tank is filled in 36 minutes?

Quantity II: If both are opened and A is closed after 10 minutes, how much further time would it take for B to fill the bucket?

- 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 can be established

8. Mr. Kapoor invested a certain amount in two schemes A and B offering compound interest @ 8% pa and 10% pa respectively. If the total amount of interest in two years was Rs. 6276 and the total amount invested was Rs. 33000,

Quantity I: The amount invested in A

Quantity II: The amount invested in B

- 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 can be established

9. The ratio of the salary of Abdul to that of Fakir is 5 : 8. If the salary of Abdul increases by 60% and that of Fakir decreases by 35% then the new ratio of their salaries becomes 40 : 27.

Quantity I: Due to extra leaves, the salary of Abdul gets deducted by $\frac{3}{4}$

Quantity II: Due to incentives, the salary of Fakir gets increased by 12%

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 can be established

10. **Quantity I:** The average of 15 number is 65, if the average of the first eight number is 67 and that of the last eight number is 63, the number that comes in the middle is:

Quantity II: Ten less than the 7th number among 13 numbers the average of which is 51, moreover, the average of the first six numbers of these 13 numbers is 52 and that of the last six is 46.

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 can be established



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Correct Answers:

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

Explanations:

1. Relative speed = (100 + 60) km/hr

$$= 160 \times \frac{5}{18} = \frac{400}{9} \text{ m/sec}$$

Let the length of the other train = x metres

$$\frac{(x + 250)}{9} = \frac{400}{9}$$

$$x + 250 = 400$$

$$x = 150 \text{ metres}$$

Quantity I: The length of other train is 150 m.

Quantity II: The length of the first train shrinks by 3/4th of that of the other train

Therefore, 3/4 of 150 = 112.5 m

Now, length of the first train = 250 - 112.5 = 137.5 m

Hence, Quantity I > Quantity II

Hence, option A is correct.

2. Quantity I:

$$\frac{{}^3C_2 + {}^5C_2}{{}^{12}C_2} = \frac{3 + 10}{66} = \frac{13}{66}$$

Quantity II:

$$\frac{{}^4C_2 + {}^5C_2}{{}^{12}C_2} = \frac{6 + 10}{66} = \frac{16}{66}$$

Hence, Quantity I < Quantity II

Hence, option B is correct.

3. Quantity I:

Let the radius of circle A be r .

Therefore, circumference of the circle A = $2\pi r$

And diameter = $2r$

Thus, $2r + 2\pi r = 174$

or, $r(1 + \pi) = 87$

$$\therefore r = \frac{87}{1 + \frac{22}{7}} = \frac{87 \times 7}{29} = 21 \text{ cm}$$

\therefore Quantity I will be 42 cm.

Now, radius of the circle B = $21 - 14 = 7$ cm

Quantity II:

Circumference of the circle B

$$= 2 \times \frac{22}{7} \times 7 = 44 \text{ cm} = \text{Quantity II}$$

Hence, Quantity I < Quantity II

Option B is hence the correct answer.



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4. Let the cost price of Quantity II be x . Therefore, the cost price of Quantity I will be = $(476 - x)$

	Quantity II	Quantity I
Cost price	x	$(476 - x)$
Selling price =	$x \times \frac{75}{100}$	$(476 - x) \times \frac{129}{100}$

Now as both the SPs are equal, $\frac{3x}{4} = (476 - x) \times \frac{129}{100}$

or, $25x = (476 - x) \times 43$

or, $25x + 43x = 476 \times 43$

or, $68x = 476 \times 43$

or, $x = 301$.

Quantity I: The cost price of the headphone at 29% profit = $476 - 301 = 175$

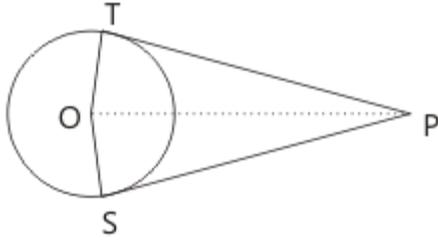
Quantity II: Selling price of the headphone sold at 25% loss

$$= 301 \times \frac{75}{100} = 225.75$$

Hence, Quantity I < Quantity II

Option B is hence the correct answer.

5.



From the above figure

$\angle OTP = 90^\circ$, (\because Radius makes an angle of 90° with the tangent at the point of tangency).

Quantity I:

In triangle OTP

$$PO^2 = PT^2 + OT^2 = 24^2 + 10^2$$

$$PO = \sqrt{24^2 + 10^2} = 26 \text{ cm}$$

Quantity II:

$$\text{Length of the hypotenuse}^2 = 15^2 + 8^2$$

Therefore, hypotenuse = 17 cm

Therefore, double of it = 34 cm

Clearly, quantity I < quantity II

Option B is hence the correct answer.

6. **Quantity I:** Perimeter of the square = $2 \times 2 (13 + 15) = 2 \times 56 = 112$ cm

let the side of a square be a.

Then, $4a = 112$ cm

$$\therefore a = 28 \text{ cm}$$

Diameter of the circle = 28 cm

$$\therefore \text{Radius} = \frac{28}{2} = 14 \text{ cm}$$

$$\therefore \text{Perimeter of the semicircle} = \pi r + 2r$$

$$= \frac{22}{7} \times 14 + 2 \times 14 = 44 + 28 = 72 \text{ cm}$$

Quantity II: Perimeter of another semicircle with a radius of 21 cm

$$= \frac{22}{7} \times 21 + 2 \times 21 = 66 + 42 = 108 \text{ cm}$$

Hence, Quantity I < Quantity II

Hence, option B is correct.

7. Quantity I: Let the tap A remains open for x minutes

The efficiency equation will be

$$\frac{x}{40} + \frac{36}{60} = 1$$

$$\Rightarrow 3x + 72 = 120 \Rightarrow 3x = 48$$

$$\therefore x = 16 \text{ minutes.}$$

Quantity II: Let the tap B remains open for x extra minutes.

The efficiency equation will be:

$$\frac{10}{40} + \frac{(10 + x)}{60} = 1$$

$$\frac{10 + x}{60} = 1 - \frac{1}{4} = \frac{3}{4}$$

$$\Rightarrow (10 + x) = 45$$

$$\therefore x = 35 \text{ minutes}$$

Clearly, Quantity I < Quantity II

Hence, option B is correct.



8. Let the amount invested by Mr. Kapoor in scheme 'A' be x and in scheme 'B' be (33000 - x)

CI Rate for two different schemes = 8% and 10%

We can calculate the effective rate of interest @ 8% for 2 years by applying the net% effect,

We get

$$= 8 + 8 + \frac{8 \times 8}{100}\% = 16 + 0.64 = 16.64\%$$

Similarly, the effective rate of interest @ 10% for 2 years

$$= 10 + 10 + \frac{10 \times 10}{100}\% = 20 + 1 = 21\%$$

Now, as per the question

$$16.64\% \text{ of } x + 21\% \text{ of } (33000 - x) = 6276$$

$$\text{or, } 16.64x + 21 \times 33000 - 21x = 627600$$

$$\text{or, } 4.36x = 693000 - 627600$$

$$\text{or, } 4.36x = 65400$$

$$\text{or, } x = 15000$$

So, invested amount in scheme A = x = 15000

And, invested amount in scheme B = (33000 - x) = 18000

Hence, Quantity I < Quantity II.

Hence, option B is correct.

9. Since no absolute value related to salary is given, we can't find either of the quantities.
Hence, no relation can be established.
Hence, option E is correct.

10.

Quantity I : Value of the middle number = (Total of first eight no. + Total of last eight no.) – Total of 15 nos
 $= (8 \times 67 + 8 \times 63) - (15 \times 65)$
 $= (536 + 504) - 975 = 1040 - 975 = 65$

Quantity II : 7th number = Total of 13 nos. – (Total of first six no. + Total of last six no.)

$= 13 \times 51 - (6 \times 52 + 6 \times 46)$
 $= 663 - (312 + 276) = 663 - 588 = 75$

Ten less than 75 = $75 - 10 = 65$

Hence, Quantity I = Quantity II

Hence, option E is correct.



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