

New Pattern Inequality in Math's Questions with Solutions



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New Pattern Inequality in quantitative aptitude Questions with solutions

Sometimes, Quantitative Comparison (Quant Comp) and Algebra may turn out to be a deadly combination on the Exams. Not so if you are good at handling inequalities! After all Quant Comp questions are nothing but inequality questions.

Quant Comp questions ask you whether Quantity A is always $>$ Quantity B, or whether Quantity B is always $>$ Quantity A, or whether Quantity A is always $=$ Quantity B. If the answer to any of these questions is yes, you have got your answer – (A), (B), and (C) respectively! If the answer to any of the above questions is “may be or may not be”, even then you have got your answer! In that case, your answer is (D)!

Let’s discuss just two simple inequality related properties and see how that can help us in solving Quant Comp questions involving Algebraic expressions.

Inequality Property 1: In any inequality you can add or subtract same quantity on both the sides and the inequality still holds good.

For example,

If $x > y$, where x , y , and a are real numbers,

$$x + a > y + a \text{ and}$$

$$x - a > y - a$$

It does not matter whether x , y , and a are positive or negative.

Inequality Property 2: In any inequality you can multiply or divide both the sides by a positive number and the inequality still holds good. However, if you multiply or divide both the sides by a negative number the inequality gets reversed.

If $x > y$, where x , y , and a are real numbers,

$$ax > ay \text{ and } x/a > y/a \text{ if } a \text{ is positive, but}$$

$$ax < ay \text{ and } x/a < y/a \text{ if } a \text{ is negative.}$$

It doesn’t matter whether x and y are positive or negative.

Now, let’s see how knowing these properties can help us solve some GRE Quant Comp questions.

Example 1 A:

x is a real number

Quantity A

$$4x - 7$$

Quantity B

$$2x + 3$$

As per Inequality Property 1 above, in any inequality, you can add or subtract same quantity on both the sides and the inequality still holds good.

Let us subtract $2x$ from and add 7 to both the quantities.

We get

Quantity A

$$2x$$

Quantity B

$$10$$

As per Inequality Property 2, in any inequality you can multiply or divide both the sides by a positive number and the inequality still holds good.

Thus by dividing both sides by 2, we get

<u>Quantity A</u>	<u>Quantity B</u>
x	5

Therefore, the answer is (D)

Now, let's look at a small variation.

Example 1B:

x is a real number greater than 5

<u>Quantity A</u>	<u>Quantity B</u>
$4x-7$	$2x+3$

The same way, this will lead us to

<u>Quantity A</u>	<u>Quantity B</u>
x	5

Since x is a real number greater than 5, the answer becomes (A)

Here's another variation.

Example 1C:

x is a real number greater than 5

<u>Quantity A</u>	<u>Quantity B</u>
$4x-8$	$2x+3$

This time, we subtract $2x$ from and add 8 to both the quantities and divide both the quantities by 2.

We get

<u>Quantity A</u>	<u>Quantity B</u>
x	5.5

We are told that x is greater than 5. Obviously, x is not necessarily an integer. Therefore, x may be less than, equal to, or greater than 5.5, and therefore the answer is (D).

Example 2A:

x is a real number greater than 5

<u>Quantity A</u>	<u>Quantity B</u>
$1/4x-7$	$1/2x+3$

Even if we want to plug in numbers for x , it may not be very convenient to do so with the question in its present form. A good idea is to multiply both sides by $(4x - 7)(2x + 3)$

We get

x is a real number greater than 5

<u>Quantity A</u>	<u>Quantity B</u>
$2x+3$	$4x-7$

Use the same process as used in Examples 1A, 1B, and 1C, and you will get the answer (B).

The most important point to note here is that we are able to do this multiplication because we know that $(4x - 7)(2x + 3)$ is always positive as both $(4x - 7)$ and $(2x + 3)$ are always positive.

Let's look at a variation of this question.

Example 2B:

x is a real number greater than 1

<u>Quantity A</u>	<u>Quantity B</u>
$1/4x-7$	$1/2x+3$

In this case, it will be erroneous to multiply both sides by $(4x - 7)(2x + 3)$ as, although $(2x + 3)$ is always positive, $(4x - 7)$ can be either positive or negative, and, therefore, $(4x - 7)(2x + 3)$ can be either positive or negative!

However, there's still a way to simplify this to some extent. We can multiply both sides by $(2x+3)$, and we get

x is a real number greater than 1

<u>Quantity A</u>	<u>Quantity B</u>
$2x+3/4x-7$	1

Now it may be a good idea to plug in values for x .

<u>Quantity A</u>	<u>Quantity B</u>
$2x+3/4x-7$	1

Put $x = 1.1$ 5.2/-2.6

Quantity B is greater; cancel out (A) and (C).

<u>Quantity A</u>	<u>Quantity B</u>
Put $x = 2$ 7/1	1

Quantity A is greater; eliminate (B) and your answer is (D).

Let's look at another variation of this question.

Example 2C:

x is a real number less than -5

<u>Quantity A</u>	<u>Quantity B</u>
$1/4x-7$	$1/2x+3$

Now, we note that both $(4x - 7)$ and $(2x + 3)$ are always negative and, therefore, $(4x - 7)(2x + 3)$ is always positive. We can just multiply both sides by $(4x - 7)(2x + 3)$ and follow the same process.

We get

x is a real number less than -5

<u>Quantity A</u>	<u>Quantity B</u>
$2x+3$	$4x-7$

Use the same process as used in Examples 1A, 1B, and 1C.

This time, however, your answer will be (A) as x is a real number less than -5

Here is one more variation — this time with a twist!

Example 2D:

x is a real number less than 7 but greater than -3

<u>Quantity A</u>	<u>Quantity B</u>
$1/x-7$	$1/x+3$

Hey! Don't just start putting values for x or start manipulating the expressions algebraically.

This time you really don't have to do anything. You just have to figure out that $(x-7)$ is always negative and $(x+3)$ is always positive. Consequently, your answer is (B). This one is really an easy question. You don't have to do anything more.

As we say at Manya-The Princeton Review, "Work smarter, not harder."

Problems On New Pattern Inequality

Q1. Quantity 1: Percentage of cement in Mortar. 900 kg of mortar consists of 45% sand, 144 kg of lime and the rest cement.

Quantity 2: Percentage of apples thrown by vendor. A vendor sells 60% of apples he had and throws away 15% of the remainder. Next day he sells 50% of the remainder and throws away the rest.

- (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

Q2. Quantity 1: Highest score. The average marks of a student in 8 subjects is 87. Of these, the highest marks are 2 more than the next in value. If these two subjects are eliminated, the average marks of the remaining subjects is 85.

Quantity 2: Number of officers. The average monthly salary of employees, consisting of officers and workers of an organization is Rs. 3000. The average salary of an officer is Rs. 10000 while that of a worker is Rs. 2000 per month. There are a total 400 employees in the organization.

- (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

Q3. Quantity 1: Cost price of article. If an article is sold at 8% profit instead of 8% loss, it would have brought Rs. 12 more.

Quantity 2: Cost price of the book. A man sells a book at a profit of 20%. If he had bought it at 20% less and sold it for Rs. 18 less he would have gained 25%.

- (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

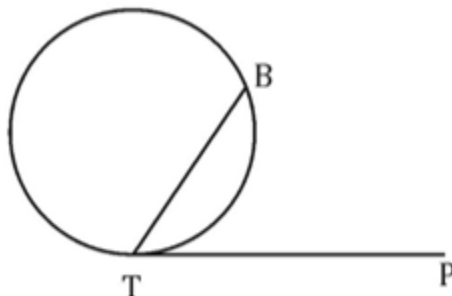
Q4. Ajit can complete a piece of work in 60 days whereas Kailash and Shailendra working together can complete it in 15 days. When Ajit and Shailendra alternately work for a day each the work gets completed in 40 days.

Quantity 1: No. of days in which Kailash will complete twice the work.

Quantity 2: No. of days in which Shailendra will complete twice the work.

- (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

Q5. In the given figure, PT is the tangent to the circle, $\angle BTP = 56^\circ$ And 'A' is any point on the minor arc BT.



Quantity 1: $\angle BAT$

Quantity 2: $\angle BOT$

- (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

Q6. Quantity 1: Cost paid by an Eskimo to make an igloo with a sheet of canvas. Base radius of the tent = 7 m and cost of canvas = Rs. 25/sq. m.

Quantity 2: Total of A's and B's shares. An amount is to be distributed among A, B and C in the ratio 3 : 1 : 5. The difference between B's and C's shares is Rs. 3600.

- (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. The difference between the time taken by two cars to travel a distance of 350 km is 2 h. 20 min. The difference between their speeds is 5 km/hr.

Quantity 1: speed of faster car.

Quantity 2: Speed of slower car.

- (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. Quantity 1: Rate of flow of the river. A motor boat can travel at 10 km/hr in still water. It travelled 91 km downstream in a river and then returned, taking altogether 20 hrs.

Quantity 2: Speed of boat in still water. A boat covers a certain distance downstream in 1 hr. while it comes back in 1.5 h. The speed of stream is 3km/hr.

- (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 two containers: the first contains 500 ml. of alcohol, while the second contains 500 ml. of water. Three cups of alcohol from the first container is taken out and is mixed well in the second container. Then, three cups of this mixture is taken out and is mixed in the first container.

Quantity 1: Proportion of water in first container.

Quantity 2: Proportion of alcohol in second container.

- (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. Quantity 1: Present age of Father. Father's age is 4 times that of his son. 5 years back, it was 7 times.

Quantity 2: Present age of man. Fifteen years hence, a man will be four times as old as he was fifteen years ago.

- (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

SOLUTIONS

S1. Ans.(a)

Sol.

Quantity 1: Amount of cement

$$= 900 - 144 - \frac{45}{100} \times 900 = 900 - 549 = 351$$

$$\text{Percentage of cement} = \frac{351}{900} \times 100 = 39\%$$

Quantity 2: % of apples thrown on day 1 = 15% of 40% = 6%

% of apples thrown on day 2 = 50% of 34% = 17%

Total % of apples thrown = (6 + 17)% = 23%

Quantity 1 > Quantity 2.

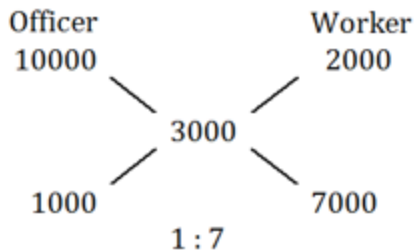
S2. Ans.(a)

Sol.

Quantity 1: Let highest marks be x ,
then the next in value is $x - 2$.

$$x + (x - 2) = 8 \times 87 - 6 \times 85 = 696 - 510 = 186$$

$$\Rightarrow x = \frac{188}{2} = 94$$

Quantity 2:

$$\text{No. of officers} = \frac{1}{8} \times 400 = 50$$

Quantity 1 > Quantity 2.

S3. Ans.(b)

Sol.

Quantity 1:

$$\frac{108}{100}x - \frac{92x}{100} = 12$$

$$\Rightarrow \frac{16x}{100} = 12$$

$$\Rightarrow x = 75$$

Quantity 2:

$$\left(\frac{120}{100}x - 18\right) - \frac{80}{100}x = \frac{25}{100} \times \frac{80}{100}x$$

$$\Rightarrow \frac{40x}{100} - \frac{20x}{100} = 18$$

$$\Rightarrow \frac{20x}{100} = 18$$

$$\Rightarrow x = 90$$

Quantity 2 > Quantity 1

S4. Ans.(e)

Sol.

Let total units of work be 60 units.

Then units done by Ajit in one day = 1 unit

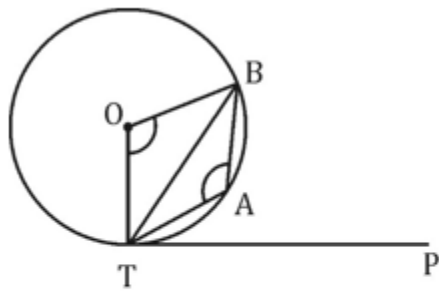
For 40 days, Ajit and Shailendra work alternately.

Ajit does $20 \times 1 = 20$ units and Shailendra does 40 units in 20 days.

i.e. Shailendra does 2 units/day.
 Kailash and Shailendra do all the units in 15 days.
 Which means Shailendra does $15 \times 2 = 30$ units and
 Kailash does remaining 30 units.
 Hence, Kailash does 2 units/day.
 Efficiency of Kailash & Shailendra is same.
 Hence, Quantity 1 = Quantity 2

S5. Ans.(a)

Sol.



Let 'O' be the centre of circle

$$\angle OTB = \angle OTP - \angle BTP = 90^\circ - 56^\circ = 34^\circ$$

$$\angle OTB = \angle OBT = 34^\circ \text{ (since } OT = OB = \text{radius)}$$

$$\angle TOB = 180 - \angle OTB - \angle OBT = 180^\circ - 34^\circ - 34^\circ = 112^\circ$$

$$\angle BAT = \frac{1}{2} \text{ reflex } \angle BOT = \frac{1}{2} \times (360^\circ - 112^\circ) = \frac{1}{2} \times 248^\circ = 124^\circ$$

Quantity 1 > Quantity 2

S6. Ans.(a)

Sol.

$$\text{Quantity 1: Area of canvas required} = 2\pi r^2 = 2 \times \frac{22}{7} \times 7 \times 7 = 308 \text{ m}^2$$

$$\text{Cost paid} = 308 \times 25 = \text{Rs. } 7700$$

Quantity 2: Let shares of A, B and C be $3x$, x & $5x$ respectively.

$$5x - x = 3600$$

$$\Rightarrow x = 900$$

$$\text{Total of A's and B's shares} = 3x + x = 4x = \text{Rs. } 3600$$

Quantity 1 > Quantity 2

S7. Ans.(a)

Sol.

$$\frac{350}{x-5} - \frac{350}{x} = \frac{7}{3}$$

$$\Rightarrow 50 \times 3 \left(\frac{x-x+5}{x(x-5)} \right) = 1$$

$$\Rightarrow x^2 - 5x - 750 = 0$$

$$\Rightarrow (x - 30)(x + 25) = 0$$

$$\Rightarrow x = 30$$

Speed of faster car = 30 km/hr

Speed of slower car = 30 - 5 = 25 km/hr

Quantity 1 > Quantity 2

S8. Ans.(b)

Sol.

Quantity 1:

$$\frac{91}{10-x} + \frac{91}{10+x} = 20$$

$$\Rightarrow x = 3 = \text{rate of flow of river}$$

Quantity 2:

$$\frac{D}{x+3} = 1, \dots\dots\dots(i)$$

$$\frac{D}{x-3} = \frac{3}{2} \dots\dots\dots(ii)$$

Solving (i) and (ii)

$$\frac{x-3}{x+3} = \frac{2}{3}$$

$$\Rightarrow x = 15 = \text{speed of boat in still water}$$

Quantity 2 > Quantity 1

S9. Ans.(e)

Sol.

Let volume of 1 cup be x ml.

	Container 1		Container 2	
	Alcohol	Water	Alcohol	Water
1 st step	$500 - 3x$	0	$3x$	500
2 nd step	$500 - 3x + \frac{3x \times 3x}{(500 + 3x)}$	$\frac{500 \times 3x}{(500 + 3x)}$	$3x - \frac{3x \times 3x}{(500 + 3x)}$	$500 - \frac{500 \times 3x}{(500 + 3x)}$
		$= \frac{1500x}{500 + 3x}$	$= \frac{1500 + 9x - 9x}{500 + 3x}$	
			$= \frac{1500}{500 + 3x}$	

Quantity 1 = Quantity 2

S10. Ans.(a)

Sol.

Quantity 1: Let present age of son be x , then father's present age is $4x$

$$4x - 5 = 7(x - 5)$$

$$\Rightarrow 30 = 3x$$

$$\Rightarrow x = 10$$

$$\text{Present age of father} = 4x = 40$$

Quantity 2:

$$x + 15 = 4(x - 15)$$

$$\Rightarrow 3x = 75$$

$$\Rightarrow x = 25$$

Quantity 1 > quantity 2

•

The ratio of the present age of Bala to that of Arnav is 3 : 11. Arnav is 12 years younger than Rahim. Rahim's age after 7 years will be 85 years.

Quantity I: The present age of Bala's father, who is 25 years older than Bala

Quantity II: Rahim's present age

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 relation cannot be established

Answer

B. Quantity I < Quantity II

$$11x = 85 - 7 - 12$$

$$x = 6$$

Present age of Bala = 18

Present age of Bala's father = $18 + 25 = 43$; Rahim's present age = 78

• **Mr. Ramesh bought two watches which together cost him Rs.440. He sold one of the watches at a loss of 20% and the other one at a gain of 40%. The selling price of both watches are same.**

Quantity I: SP and CP one of the watches sold at a loss of 20%

Quantity II: SP and CP one of the watches sold at a profit of 40%

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 relation cannot be established

Answer

D. Quantity I \leq Quantity II

$$80/100 * x = 140/100 * y$$

$$x = 7/4y$$

$$x + y = 440$$

$$7/4 y + y = 440$$

$$y = 160 ; x = 280$$

• **Ravi, Hari and Sanjay are three typists, who working simultaneously, can type 228 pages in four hours. In one hour, Sanjay can type as many pages more than Hari as Hari can type more than Ravi. During a period of five hours, Sanjay can type as many passages as Ravi can, during seven hours.**

Quantity I: Number of pages typed by Ravi

Quantity II: Number of pages typed by Hari

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 relation cannot be established

Answer

B. Quantity I < Quantity II

Let Ravi, Hari and Sanjay can type x , y , and z pages respectively in 1 h.

Therefore, they together can type $4(x + y + z)$ pages in 4 h

$$\therefore 4(x + y + z) = 228$$

$$\Rightarrow x + y + z = 57 \dots(i)$$

Also, $z - y = y - x$

i.e., $2y = x + z \dots(ii)$

$$5z = 7x \dots(iii)$$

From Eqs. (i) and (ii), we get

$$3y = 57$$

$$\Rightarrow y = 19$$

From Eq. (ii), $x + z = 38$

$$x = 16 \text{ and } z = 22$$

• **The length of a rectangle wall is $\frac{3}{2}$ times of its height. The area of the wall is 600m^2 .**

Quantity I: Height of the wall

Quantity II: Length of the wall

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 relation cannot be established

Answer

A. Quantity I > Quantity II

$$\text{length} = 3x$$

$$\text{height} = 2x$$

$$\text{Area of the wall} = 3x * 2x = 6x^2 = 600$$

$$\text{Length} = 30 \text{ \& Height} = 20$$

• **Quantity I: $x^2 - 26x + 168 = 0$**

Quantity II: $y^2 - 29y + 210 = 0$

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 relation cannot be established

Answer

D. Quantity I \leq Quantity II

$$x^2 - 26x + 168 = 0$$

$$x = 12, 14$$

$$y^2 - 29y + 210 = 0$$

$$y = 14, 15$$

• **Quantity I: $x^2 - 21x + 110 = 0$**

Quantity II: $y^2 - 18x + 80 = 0$

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 relation cannot be established

Answer

C. Quantity I \geq Quantity II

$$x^2 - 21x + 110 = 0$$

$$x = 10 \ 11$$

$$y^2 - 18y + 80 = 0$$

$$y = 10 \ 8$$

• A Cistern has an inlet pipe and outlet pipe. The inlet pipe fills the cistern completely in 1 hour 20 minutes when the outlet pipe is plugged. The outlet pipe empties the tank completely in 6 hours when the inlet pipe is plugged.

Quantity I: X = Inlet Pipe Efficiency

Quantity II: Y = Outlet Pipe Efficiency

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 relation cannot be established

Answer

A. Quantity I > Quantity II

$$\text{Inlet pipe Efficiency} = 100/(8/6) = 75\%$$

$$\text{Outlet pipe Efficiency} = 100/(6) = 16.66\%$$

• Out of 14 applicants for a job, there are 6 women and 8 men. It is desired to select 2 persons for the job.

Quantity I: Probability of selecting no woman

Quantity II: Probability of selecting at least one woman

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 relation cannot be established

Answer

B. Quantity I < Quantity II

$$\text{Man only} = {}^8C_2 = 14$$

$$\text{Probability of selecting no woman} = 14/91$$

$$\text{Probability of selecting at least one woman} = 1 - 14/91 = 77/91$$

• A basket contains 6 White 4 Black 2 Pink and 3 Green balls. If four balls are picked at random,

Quantity I: Probability that at least one is Black.

Quantity II: Probability that all is Black.

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 relation cannot be established

Answer

A. Quantity I > Quantity II

Total Balls = 15

Probability = $\frac{11C4}{15C4} = \frac{22}{91}$

One is black = $1 - \frac{22}{91} = \frac{69}{91}$

• **Two pipes A and B can fill a tank in 12 hours and 18 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom of the tank it took 48 minutes excess time to fill the cistern.**

Quantity I: Due to leakage, time taken to fill the tank

Quantity II: Time taken to empty the full cistern

- 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 relation cannot be established

Answer

B. Quantity I < Quantity II

Work done by the two pipes in 1 hour = $(\frac{1}{12}) + (\frac{1}{18}) = (\frac{15}{108})$.

Time taken by these pipes to fill the tank = $(\frac{108}{15})$ hrs = 7 hours 12 min.

Due to leakage, time taken to fill the tank = 7 hours 12 min + 48 min = 8 hours

Work done by two pipes and leak in 1 hour = $\frac{1}{8}$.

Work done by the leak in 1 hour = $(\frac{15}{108}) - (\frac{1}{8}) = (\frac{1}{72})$.

Leak will empty the full cistern in 72 hours.

•

Quantity I: The age of teacher, if the average age of 36 students is 14. When teacher's age is included the average increases by 1.

Quantity II: The age of teacher, if the average age of 19 students is 35. When teacher's age is included the average increases by 0.5.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

$$I A = a + or - nd$$

$$14 + (37 * 1) = 14 + 37 = 51 \text{ yrs.}$$

$$II 35 + (20 * 0.5) = 35 + 10 = 45 \text{ yrs.}$$

• Quantity I: Profit Percentage, if Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6.

Quantity II: Profit Percentage, if 100 toys are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen.

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I If the no of article bought is LCM of 6 and 5 is 30

$$CP \text{ of } 30 \text{ articles} = 5/6 * 30 = \text{Rs} 25$$

$$SP \text{ of } 30 \text{ articles} = 6/5 * 30 = \text{Rs} 36$$

$$\text{Profit } 36 - 25 = 11$$

$$\text{Profit \%ge} = 11/25 * 100 = 44\%$$

$$II \text{ CP of } 1 \text{ toy} = 350/100 = 3.50$$

$$SP \text{ of } 1 \text{ toy} = 48/12 = 4.$$

$$\text{Profit} = 4 - 3.5 = 0.5.$$

$$\text{Profit \%ge } (0.5/3.5) * 100 = 14 \frac{2}{7}\%$$

• Quantity I: On selling 17 balls at Rs. 720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is:

Quantity II: A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. The selling price is:

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

$$I. \text{ C.P. of } 12 \text{ balls} = \text{S.P. of } 17 \text{ balls} = \text{Rs. } 720.$$

CP of 1 ball = $720/12 = \text{Rs}60$.

II. SP = 85% of 1400

= $85/100 * 1400$

= Rs1190.

• Quantity I: A and B together can do a piece of work in 4 days. If A alone can do the same work in 6 days, then B alone can do the same work in?

Quantity II: A can do a piece of work in 4 hours; B and C together can do it in 3 hours, while A and C together can do it in 2 hours. How long will B alone take to do it?

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I. B work = $1/4 - 1/6 = 2/24 \implies 12$ days

II. A's 1hr work $1/4$.

(B+C's) 1 hr work $1/3$.

(A+C's) 1hr work $1/2$.

A+B+C 1hr work = $1/4 + 1/3 = 7/12$.

B's work = $7/12 - 1/2 = 1/12$

12hours.

• Quantity I: A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed of the tour is:

Quantity II: A went from P to Q with the speed of 60km/hr. and return back with the speed of 90km/hr. Find the average speed.

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

I. Total time taken = $(160/64 + 160/80) = 9/2$ hrs

Then avg speed = $320/(9/2)$

= $320 * 2/9 = 71.11$ km/hr.

II. $(2*60*90)/150=72\text{km/hr.}$

• Quantity I: The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

Quantity II: Find the speed of a train which passes a tree in 12 seconds. The length of the train is 264m.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I. Let the speed of two trains be $7x$ and $8x$.

$$400/4=100$$

$$8x=100 \Rightarrow x=12.5.$$

Then speed of first train = $7*12.5 = 87.5\text{km/hr.}$

II. Length of the train = 264m.

Time taken to pass the tree = 12 seconds.

Speed of the train = $264/12 \text{ m/sec} = 22 \text{ m/sec} = 22 * 18/5 \text{ km/hr} = 79.2 \text{ km/hr.}$

• Quantity I: A and B started a business by investing Rs. 20000 and Rs. 35000 respectively. Find the share of B out of an annual profit of Rs. 3520.

Quantity II: X and Y invested in a business. Their profit ratio is 2:3. If X invested Rs. 4000. Find the amount invested by Y?

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

$$I \text{ Ratio } 20:35=4:7$$

$$11 == 3520$$

$$7 ? \Rightarrow \text{Rs}2240.$$

$$\text{II } 4000/y = 2/3$$

$$y = 6000.$$

• *Quantity I: The age of P is twelve times that of her daughter Q. If the age of Q is 3 years, what is the age of P?*

Quantity II: The ratio between the present ages of A and B is 2:3. 4 years ago the ratio between their ages was 5:8. What will be A's age after 7 years?

- A) Quantity I > Quantity II
 B) Quantity I ≥ Quantity II
 C) Quantity II > Quantity I
 D) Quantity II ≥ Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I

Ratio P:Q 12:1

1.....== 3

12 ? == 12*3 =36years.

II

$(5x+4)/(8x+4) = 2/3$

$15x+12 = 16x+8$

$x=4.$

A's age 4 yrs ago $5*4=20$

Then A's age after 7yrs is $20+4+7=31$ yrs.

• *Quantity I: The difference between SI and CI compounded annually on a certain sum of money for 2 years at 8% per annum is Rs. 12.80. Find the principal.*

Quantity II: A sum fetched a total simple interest of Rs. 800 at the rate of 8 %per annum in 5 years. What is the sum?

- A) Quantity I > Quantity II
 B) Quantity I ≥ Quantity II
 C) Quantity II > Quantity I
 D) Quantity II ≥ Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

Solution:

$$I \text{ SI} = \frac{Pr_2}{100}$$

$$P * 8\frac{2}{5} / 100 = 12.8$$

$$64P / (100 * 100) = 12.8$$

$$P = \text{Rs}2000.$$

$$II \text{ SI} = \frac{Pnr}{100}$$

$$800 = \frac{P * 8 * 5}{100}$$

$$P = \frac{800 * 100}{40}$$

$$= \text{Rs}2000.$$

• There are 5 Brown balls, 4 Blue balls & 3 black balls in a bag .Four balls are chosen at random

Quantity I: The probability of their being 2 Brown and 2 Blue ball

Quantity II: The probability of their being 2 Brown, 1 Blue & 1 blacks

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

$$I. \frac{(5c_2 * 4c_2)}{12c_4} = \frac{60}{495} = \frac{4}{33}$$

$$II. \frac{(5c_2 * 4c_1 * 3c_1)}{12c_4} = \frac{120}{95} = \frac{8}{33}$$

Directions: Each question below contains a statement followed by Quantity I and Quantity II.

Find both to find the relationship among them. Mark your answer accordingly.

1. If the quantity of milk in mixture is 10 litre then find the quantity of water if

Quantity I: After selling it at CP, milkman saves 25%

Quantity II: If the ratio of Milk and water is 5:1

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Quantity I.

Milk : Water

100 : 25

$$10=4 : 1=2.5$$

In Quantity 2:

$$5=10 ; 1=2$$

Quantity 1 > Quantity 2

2. Find the original consumption if

Quantity I: After increasing price by 20% a family now gets 5 kg less on that price.

Quantity II: After increasing price by 25%, a family increases its expenditure by 10% and gets 6 kg less than original consumption

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Quantity I: 20% Increase = $\frac{1}{5}$

$$\frac{1}{1+5} * T = 5$$

$$T = 30 \text{ Kg}$$

Quantity II:

$$100$$

$$110$$

$$125$$

$$125 - 110 = 15$$

$$\frac{15}{125} * T = 6$$

$$T = 50 \text{ Kg}$$

$$II > I$$

3. Find the present age of A

Quantity I: Three years before, the ratio of ages of A and B was 5:6. Three years hence this ratio will become 6:7

Quantity II: Eleven years before the ratio of ages of A and B was 1:3 and eleven years hence the ratio will become 1:2

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer**Option E**

Quantity I: A B
 3 years before 5 6
 3 years after 6 7
 Difference in both case $6-5=1$ and $7-6=1$
 $1=6$

 $6=30$ Present age = $30+3=33$

Quantity II: A B
 11 years before 1 3
 11 years after 1 2
 Difference $A=1-1=0$; $B=-1$

To make the difference same; multiply equation 2 by 2; we get

Quantity II: A B
 11 years before 1 3
 11 years after 2 4
 Difference $A=2-1=1$; $B=4-3=1$

 $1=2$ $11=22$ Present age = $22+11=33$

4. Find the sum

Quantity I: If the Compound Interest for 2 years at 20% rate of interest is Rs 1,320.

Quantity II: If the amount on a sum for 2 years in which rate of interest for 3 years makes a sum of 125 to amount 216 is Rs 2880.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer**Option A**CI for 2 years on $20\%=1/5$

5 6

5 6

$$5*5=25 \quad 6*6=36$$

$$CI=36-25=11 \quad =1320$$

$$Sum=25=3000$$

Quantity II: Find Rate

Cube root(125): Cube root (216)

5:6

$$rate = (6-5)/5 * 100 = 20\% = 1/5$$

5 6

5 6

$$5*5=25 \quad 6*6=36$$

$$36=2880; \text{ hence } 25=2000$$

I > II

5. Find the distance if

Quantity I: A man covers a distance in 15 hours. He covers first half at 12 kmph and second half at 15 kmph.

Quantity II: Two buses moves towards each other at a speed of 30 kmph and 40 kmph respectively. When they meet it is found that faster bus covers 30 km more than slower one.

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

$$\text{Average Speed} = 2*12*15/(12+15)$$

$$D = S*T = 2*12*15/27 * 15 = 200 \text{ KM}$$

Quantity II: Speed difference for 1 hour = 40-30=10 Kmph; means in 1 hour faster bus will cover 10 km more than slower one; hence to cover 30 km more it will take 3 hours.

Distance = Relative Speed * Time

$$D = 3 * (30+40)$$

$$= 210 \text{ KM}$$

II > I

6. Quantity I: Selling price, if cost price is Rs 24,000 and profit is 20%

Quantity II: Selling price, if cost price is Rs 24,000 and shopkeeper gained 16 2/3% after giving discount of 25%

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

- D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer**Option A**

$$SP = 120/100 * 24000 = 28800$$

$$\text{Discount} = 25\% = 1/4 \text{ (MP} = 4, \text{ SP} = 4-1 = 3)$$

$$\text{Gain} = 16 \frac{2}{3}\% = 1/6 \text{ (CP} = 6, \text{ SP} = 6+1 = 7)$$

Make SP same

$$CP \dots \dots \dots SP \dots \dots \dots MP$$

$$18 \dots \dots \dots 21 \dots \dots \dots 28$$

$$18 == 24000$$

$$\text{So } 21 == 28000$$

7. Quantity I: No. of days in which A will work alone, given A and B can complete work in 8 days, B and C can complete work in 12 days, C and A can complete work in 8 days.
 Quantity II: No. of days in which A will work alone, given A and B can complete work in 18 days, they started work together and after working for 6 days A left and B completed remaining work in 24 days.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer**Option C**

$$LCM = 24$$

So

$$A + B = 24/8 = 3$$

$$B + C = 24/12 = 2$$

$$C + A = 24/8 = 3$$

$$2(A+B+C) = 3+2+3 = 8$$

$$A+B+C = 4$$

$$(A+B+C) - (B+C) = 4 - 2 = 2$$

$$\text{So } A = 24/2 = 12 \text{ days}$$

$$A = 36 \text{ days}$$

8. Quantity I: Volume, if diameter of sphere is 14 cm
 Quantity II: Volume, if side of cube is 8 cm
 A) Quantity I > Quantity II

- B) Quantity I \geq Quantity II
 C) Quantity II $>$ Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Quantity I. Volume of sphere = $(4/3) * \text{Pie} * R^3$

$R=7$; Volume= 1437.33

Quantity II: $V=a^3 = 8^3 = 512$

$I > II$

9. Quantity I: x where: $3x^2 + 2x - 8=0$
 Quantity II: y where: $3y^2 + 5y -12 =0$
 A) Quantity I $>$ Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II $>$ Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

$x = -2$ and $4/3$; $y = -3$ and $4/3$; So no relation

10. Quantity I: x where: $4x^2 - 16x + 15 = 0$
 Quantity II: y where: $2y^2 + y -6 = 0$
 A) Quantity I $>$ Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II $>$ Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option B

$x = 3/2$ and $5/2$

$y = -2$ and $3/2$

Directions: Each question below contains a statement followed by Quantity I and Quantity II. Find both to find the relationship among them. Mark your answer accordingly.

1. If x and y are natural numbers and $5 > x > y > 0$.

Quantity I: $3x^2y$

Quantity II: $4xy^2$

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \leq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option B

Explanation:

Divide both equations. So

$$I/II = 3x/4y$$

$$\text{Or } I = 3x/4y * II$$

Now y has to be > 0 and x has to be $> y$

$$\text{If } x = 2, y = 1, I > II$$

$$\text{If } x = 3, y = 1, I > II$$

Similarly we will get $I > II$ in all cases

Now x has to be < 5 ,

So check If $x = 4, y = 3$, then $I = II$

So final we get $I \geq II$

2. A and B started a business with Rs 10,000 and Rs 15,000 respectively. After 6 months C joined them with Rs 20,000.

Quantity I: B's share in total profit of Rs 4,00,000 at the end of 2 years.

Quantity II: Annual Salary of Rohit after tax deduction if he earns Rs 20,000 per month and pays a tax of 20% each month.

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \leq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Explanation:

$$I: A:B:C = 10000*24 : 15000*24 : 20000*18 = 2:3:3$$

$$B = 3/8 * 4,00,000 = \text{Rs } 1,50,000$$

$$II: \text{Salary after deduction} = 20,000 * 12 * 80/100 = \text{Rs } 1,92,000$$

Hence $I < II$

3. A can do a work in 16 days. B is 60% more efficient than A.

Quantity I: Time taken by A and B together to do the work.

Quantity II: Time taken by A and B to do the work together when A works at double his original efficiency and B works at half his original efficiency.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Explanation:

I: A=16 days ; B = $16 * 100/160=10$ days

A+B together = $16*10/(26)=80/13$ days

II: A = 16 days ; B = 10 days

A(double efficiency) = 8 days ; B(half efficiency) = 20 days

A+B together = $80/14$

hence I > II

4. The value of a machine depreciates at 10% per annum

Quantity I: Value of machine after 2 years, if the present value of machine is Rs 96000

Quantity II: Distance travelled by a taxi in 1 year, if it travels at a constant speed of 40kmph and covers 213 kilometers everyday.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

Explanation:

Value of machine after 2 years = $96000*90/100*90/100=$ Rs 77,760

II: Here we do not need speed, as we can find the total distance travelled by the everyday distance.

If the year is leap year then total distance travelled = $213*366=$ 77,958 km

if non leap year then = $213*365 =$ 77,745 km

hence relation cannot be established.

5. A rectangular plot measuring 80 meters by 40 meters is to be enclosed by wire fencing along the boundary of the plot. The fence will be tied on poles that will be placed along the boundary.

Quantity I: Number of poles required for fencing if each pole is at a distance of 24 meters.

Quantity II: Radius of a circle whose area is 10% of the area of the rectangular plot.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Explanation:

I: Perimeter = $2(80+40)=240$

No. of poles = $240/24=10$

II: Area of circle = $320 \Rightarrow \frac{22}{7} * r * r = 320$

$r=101.81 \Rightarrow r > 10$

Hence II > I

6. A bag contains 3 red, 4 green and 2 blue balls. Two balls are drawn at random.

Quantity I: Probability that None of the ball drawn is blue.

Quantity II: Fraction of work completed by A in 7 days if he is 20% more efficient than B who can complete the work in 12 days.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Explanation:

I: $\frac{{}^7C_2}{{}^9C_2} = \frac{7}{12}$

II: A \rightarrow 10 days \Rightarrow fraction of work in 7 days = $\frac{7}{10}$

Hence II > I

7. Suresh took a loan from bank at 12% p.a simple interest. After 3 years he had to pay back Rs. 16,200 as interest.

Quantity I: Loan taken by Suresh from the bank.

Quantity II: Amount after 2 years for a principal of Rs 35,000 at interest rate of 10%

compounded annually.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Explanation:

$$I: P=16200*100/(3*12)=Rs\ 45,000$$

$$II: A= 35000*121/100=Rs\ 42,350$$

Hence $I > II$

8. A man can row 9 kmph in still water. It takes him twice as long to row up as to row down the river.

Quantity I: Rate of stream.

Quantity II: Speed of a man in still water who can row upstream at 4 kmph and downstream at 2 kmph.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

Explanation:

$$I: 9+y=2(9-y)$$

$$y = 3\ \text{kmph}$$

$$II: x = (4+2)/2=3\ \text{kmph}$$

Hence $I = II$

9. A man can row at a speed of 8 kmph in still water to a certain upstream point and back to the starting point in a river flowing at 4 kmph.

Quantity I: Average speed of man for the total journey.

Quantity II: Speed of a cyclist, cycling in a circular ground of radius 7 kilometer if he takes 4 hour to complete one full round of the ground.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I

- D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Explanation:

I: Average Speed = $U * D/x$

$U = (8+4) = 12$; $D = (8 - 4) = 4$

Avg Speed = $12 * 4/8 = 6$ kmph

II: Distance(Circumference) = $2*\pi*r = 44$ km ; Time = 4 hours

Speed = $44/4 = 11$ kmph

hence II > I

10. A train 175 meter long passes a man moving at 6 kmph in the same direction in which the train is going, in 10 seconds.

Quantity I: Speed of the train.

Quantity II: Average speed of a car going from point A to B at 65 kmph and back from point B to A at 70 kmph.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Explanation:

I: Relative speed = $175/10$ m/s = $(175/10)*(18/5) = 63$ kmph

Let speed of train = x kmph => relative speed = x-6

$x - 6 = 63$

=> $x = 69$ kmph

II: Avg speed = $(2*65*70)/(65+70) = 67.40$ kmph

Hence I > II

Directions: Each question below contains a statement followed by Quantity I and Quantity II. Find both to find the relationship among them. Mark your answer accordingly.

1. The price of item X is marked at Rs 10,000. After giving a discount of 4%, a gain of 20% is achieved.

Quantity I: Cost Price of Item X.

Quantity II: Selling Price of item Y after two successive discount of 10% and 15% is

provided on the Marked Price of Rs 10,000.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I : Mp = Rs 10,000; SP after 4% discount = Rs 9600; CP = Rs 8000

II : SP = $10,000 \times \frac{90}{100} \times \frac{85}{100}$ = Rs 7650

Hence I > II

2. **Quantity I:** Simple Interest on a sum of Rs 6200 at the rate of 6% per annum for 5 years

Quantity II: Compound Interest on a sum of Rs 6400 at rate of 10% compounded semi-annually for one year.

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I
- E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I: SI = $6200 \times 6 \times 5 / 100$ = Rs 1860

II: CI = $6400 [1 - \frac{5}{100}]^2 - 6400$ = Rs 1376

Hence I > II

3. The price of item X is marked at Rs 10,000. After giving a discount of 4%, a gain of 20% is achieved.

Quantity I: Cost Price of an article if it is sold making a loss of 10% given that if the cost price was 20% less, a profit of Rs 12 could be made.

Quantity II: Labeled Price of an article if a discount of 30% is given on it and then sold for Rs 105 at a loss of 20%

- A) Quantity I > Quantity II
- B) Quantity I \geq Quantity II
- C) Quantity II > Quantity I
- D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

Solution:

I: Let CP = Rs 100, then at 10% loss, SP = Rs 90

Now if CP is 20% less, means CP = Rs 80, then profit is = $90 - 80 = \text{Rs } 10$
but given profit is Rs 12

So if profit is Rs 10, then CP = Rs 100

If profit is Rs 12, then CP is $100/10 * 12 = \text{Rs } 120$

II: Use formula $MP = (100 - \text{loss}\%)/(100 - \text{discount}\%) * CP$

So $MP = (100 - 20)/(100 - 30) * 105 = \text{Rs } 120$

Hence I = II

4. Given that $x < 0$ and $y > 0$

Quantity I: $14x^3y^2$

Quantity II: $28x^2y^3$

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

I: Since $x < 0$, so I will always be negative

II: It will be always positive

Hence $I < II$

5. **Quantity I:** Area of rectangle whose sides are in the ratio 3 : 1 and perimeter twice the circumference of a semi-circle with area 77cm^2

Quantity II: Curved surface area of a cylinder of radius 12 cm and height equal to the side of square of area 49cm^2

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer**Option C**

Solution:

$$I: \frac{1}{2} \pi r^2 = 77 \text{ [area of semicircle]}$$

$$\text{So } r = 7 \text{ cm}$$

$$\text{So circumference of semicircle} = \pi r = 22 \text{ cm}$$

$$\text{So perimeter of rectangle} = 2 * 22 = 44 \text{ cm}$$

$$\text{So } 3x + x = 44 \text{ cm, } x = 11,$$

$$\text{So area of rectangle} = 3x^2 = 363 \text{ cm}^2$$

$$II: \text{ height of cylinder} = \sqrt{49} = 7 \text{ cm}$$

$$\text{So CSA} = 2\pi rh = 528 \text{ cm}^2$$

Hence $I < II$

6. **Quantity I:** Time taken by A to complete $\frac{1}{5}$ th of work if B takes 6 days to complete $\frac{3}{5}$ th of work and together they take 5 days to complete $\frac{3}{4}$ th of work

Quantity II: Time taken by a train to cross a platform of length 60 km given that it crosses a pole in two and a half hours running at 60 km/hr

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer**Option A**

Solution:

$$I: \text{ A and B completes } \frac{3}{4} \text{th work in 5 days, so complete 1 work in } \frac{4}{3} * 5 = \frac{20}{3} \text{ days}$$

$$\text{B complete } \frac{3}{5} \text{ work in 6 days, so complete work in } \frac{5}{3} * 6 = 10 \text{ days}$$

$$\text{So in 1 day A completes} = \frac{3}{20} - \frac{1}{10} = \frac{1}{20}$$

$$\text{So to complete } \frac{1}{5} \text{th work} = \frac{1}{5} * 20 = 4 \text{ days}$$

$$II: \text{ length of train} = 2.5 * 60 = 150 \text{ km}$$

$$\text{So time taken to cross platform of length 60 km with speed 60 km/hr} = \frac{(150+60)}{60} = 3.5 \text{ hrs}$$

Hence $I > II$

7. **Quantity I:** Age of A five years ago if 6 years hence ratio of age of A to B will be 14 : 11, and 1 year ago the ratio was 7 : 5.

Quantity II: Average age of 2 students included in a group of 5 students with average age 18 years given that addition of these 2 students in group makes average increase by 1.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

$$I: (A+6)/(B+6) = 14/11$$

$$\text{And } (A-1)/(B-1) = 7/5$$

Solve the equations, $A = 22$, so 5 years ago = $22 - 5 = 17$ years

$$II: \text{Total age of 2 students added to group} = 18*2 + 7*1 = 43$$

So their average age = $43/2 = 21.5$ years

Hence $I < II$

8. **Quantity I:** x , such that $6x^2 + 22x + 15 = 0$

Quantity II: y , such that $6y^2 - 7y - 10 = 0$

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option D

Solution:

$$I: x = -3, -5/6$$

$$II: y = -5/6, 2$$

Hence $I \leq II$

9. A shopkeeper gets a discount of 20% on an article and sells it at 10% profit.

Quantity I: Labeled price as a percent of cost price.

Quantity II: Profit percent if discount given is 60%

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Solution:

$$I: MP = (100+10)/(100-20) * CP = 11/8 \text{ of } CP$$

$$\text{So required \%} = \text{MP/CP} * 100 = (11\text{CP}/8)/\text{CP} * 100 = 137.5\%$$

$$\text{II: \% profit} = (100+10) [(100-10)/(100-60)] - 100 = 590/4 = 147.5\%$$

Hence $I < II$

10. **Quantity I:** Speed of boat in still water if it took 24 hours to cover a distance of 64 km going downstream and back. Given the speed of current to be 2 km/hr

Quantity II: Average speed of a boy to go from home to school if his average speed is 2 km/hr from school to home and he covers a total of 12 km in 5 hours.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Solution:

I: Let speed of boat = x km/hr

$$\text{So } 64/(x+2) + 64/(x-2) = 24$$

Solve, x = 6 km/hr

II : Distance from home to school is $12/2 = 6$ km

Let speed from home to school is x km/hr

So using distance = total time * average speed

$$6 = 5 * [2*x/(2+x)]$$

Solve, x = 3 km/hr

Hence $I > II$

Directions: Each question below contains a statement followed by Quantity I and Quantity II. Find both to find the relationship among them. Mark your answer accordingly.

1. If the quantity of milk in mixture is 10 litre then find the quantity of water if

Quantity I: After selling it at CP, milkman saves 25%

Quantity II: If the ratio of Milk and water is 5:1

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A**Explanation:**

Quantity I.

Milk : Water

100 : 25

 $10=4 : 1=2.5$

In Quantity 2:

5=10 ; 1=2

Quantity 1 > Quantity 2

2. Find the original consumption if

Quantity I: After increasing price by 20% a family now gets 5 kg less on that price.

Quantity II: After increasing price by 25%, a family increases its expenditure by 10% and gets 6 kg less than original consumption

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer**Option C****Explanation:**Quantity I: 20% Increase = $\frac{1}{5}$ $\frac{1}{(1+\frac{1}{5})} * T = 5$

T = 30 Kg

Quantity II:

100

110

125

 $125 - 110 = 15$ $\frac{15}{125} * T = 6$

T = 50 Kg

II > I

3. Find the present age of A

Quantity I: Three years before, the ratio of ages of A and B was 5:6. Three years hence this ratio will become 6:7

Quantity II: Eleven years before the ratio of ages of A and B was 1:3 and eleven years hence the ratio will become 1:2

A) Quantity I > Quantity II

- B) Quantity I \geq Quantity II
 C) Quantity II $>$ Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer**Option E****Explanation:**

Quantity I:	A	B
3 years before	5	6
3 years after	6	7

Difference in both case $6-5=1$ and $7-6=1$
 $1=6$
 $6=30$

Present age = $30+3=33$

Quantity II:	A	B
11 years before	1	3
11 years after	1	2

Difference $A=1-1=0$; $B=-1$

To make the difference same; multiply equation 2 by 2; we get

Quantity II:	A	B
11 years before	1	3
11 years after	2	4

Difference $A=2-1=1$; $B=4-3=1$

$1=2$

$11=22$

Present age = $22+11=33$

4. Find the sum

Quantity I: If the Compound Interest for 2 years at 20% rate of interest is Rs 1,320.

Quantity II: If the amount on a sum for 2 years in which rate of interest for 3 years makes a sum of 125 to amount 216 is Rs 2880.

- A) Quantity I $>$ Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II $>$ Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A**Explanation:** CI for 2 years on 20%=1/5

$$\frac{5}{5} \quad \frac{6}{6}$$

$$\frac{5}{5} \quad \frac{6}{6}$$

$$5*5=25 \quad 6*6=36$$

$$CI=36-25=11 =1320$$

$$Sum=25=3000$$

Quantity II: Find Rate

Cube root(125): Cube root (216)

$$5:6$$

$$rate = (6-5)/5 * 100 = 20\% = 1/5$$

$$\frac{5}{5} \quad \frac{6}{6}$$

$$\frac{5}{5} \quad \frac{6}{6}$$

$$5*5=25 \quad 6*6=36$$

$$36=2880; \text{ hence } 25=2000$$

$$I > II$$

5. Find the distance if

Quantity I: A man covers a distance in 15 hours. He covers first half at 12 kmph and second half at 15 kmph.

Quantity II: Two buses moves towards each other at a speed of 30 kmph and 40 kmph respectively. When they meet it is found that faster bus covers 30 km more than slower one.

A) Quantity I > Quantity II

B) Quantity I \geq Quantity II

C) Quantity II > Quantity I

D) Quantity II \geq Quantity I

E) Quantity I = Quantity II or Relation cannot be established

Answer**Option C****Explanation:**

$$\text{Average Speed} = \frac{2*12*15}{12+15}$$

$$D = S * T = \frac{2*12*15}{27} * 15 = 200 \text{ KM}$$

Quantity II: Speed difference for 1 hour = 40-30=10 Kmph; means in 1 hour faster bus will cover 10 km more than slower one; hence to cover 30 km more it will take 3 hours.

Distance= Relative Speed * Time

$$D = 3 * (30+40)$$

$$= 210 \text{ KM}$$

$$II > I$$

6. Quantity I: Selling price, if cost price is Rs 24,000 and profit is 20%

Quantity II: Selling price, if cost price is Rs 24,000 and shopkeeper gained 16 2/3% after giving

discount of 25%

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Explanation: $SP = 120/100 * 24000 = 28800$

Discount = 25% = $1/4$ (MP = 4, SP = 4-1 =3)

Gain = $16 \frac{2}{3}\%$ = $1/6$ (CP = 6, SP = 6+1 = 7)

Make SP same

CP.....SP.....MP

18.....21.....28

18 == 24000

So 21 == 28000

7. Quantity I: No. of days in which A will work alone, given A and B can complete work in 8 days, B and C can complete work in 12 days, C and A can complete work in 8 days.

Quantity II: No. of days in which A will work alone, given A and B can complete work in 18 days, they started work together and after working for 6 days A left and B completed remaining work in 24 days.

- A) Quantity I > Quantity II
 B) Quantity I \geq Quantity II
 C) Quantity II > Quantity I
 D) Quantity II \geq Quantity I
 E) Quantity I = Quantity II or Relation cannot be established

Answer

Option C

Explanation: LCM = 24

So

$$A + B = 24/8 = 3$$

$$B + C = 24/12 = 2$$

$$C + A = 24/8 = 3$$

$$2(A+B+C) = 3+2+3 = 8$$

$$A+B+C = 4$$

$$(A+B+C) - (B+C) = 4 - 2 = 2$$

$$\text{So } A = 24/2 = 12 \text{ days}$$

$$A = 36 \text{ days}$$

8. Quantity I: Volume, if diameter of sphere is 14 cm
Quantity II: Volume, if side of cube is 8 cm
- A) Quantity I > Quantity II
 - B) Quantity I \geq Quantity II
 - C) Quantity II > Quantity I
 - D) Quantity II \geq Quantity I
 - E) Quantity I = Quantity II or Relation cannot be established

Answer

Option A

Explanation:

Quantity I. Volume of sphere = $(4/3) * \text{Pie} * R^3$

$R=7$; Volume= 1437.33

Quantity II: $V=a^3 = 8^3 = 512$

$I > II$

9. Quantity I: x where: $3x^2 + 2x - 8=0$
Quantity II: y: where: $3y^2 + 5y -12 =0$
- A) Quantity I > Quantity II
 - B) Quantity I \geq Quantity II
 - C) Quantity II > Quantity I
 - D) Quantity II \geq Quantity I
 - E) Quantity I = Quantity II or Relation cannot be established

Answer

Option E

Explanation: $x= -2$ and $4/3$; $y= -3$ and $4/3$; So no relation

10. Quantity I: x where: $4x^2 - 16x + 15 = 0$
Quantity II: y where: $2y^2 + y -6 = 0$
- A) Quantity I > Quantity II
 - B) Quantity I \geq Quantity II
 - C) Quantity II > Quantity I
 - D) Quantity II \geq Quantity I
 - E) Quantity I = Quantity II or Relation cannot be established

Answer

Option B

Explanation: $x = 3/2$ and $5/2$

$y= -2$ and $3/2$

Directions (Q.1-5): Compare the value of 2 quantities given in the question and give answer.

(a) if quantity I > quantity II

(b) if quantity I < quantity II

(c) if quantity I \geq quantity II

(d) if quantity I \leq quantity II

(e) if quantity I = quantity II or no relation can be established.

Q1. Quantity I — cost price of an article having marked price Rs. 400, which when sold at 20% discount still make a gain of 20/3%

Quantity II — cost price of an article which is sold at 14% profit and if cost price and selling price both are Rs. 117 less, the profit would be 9% more.

S1. Ans. (a)

Sol.

$$\text{Quantity I — SP} = 400 \times \frac{80}{100} = 320$$

$$\text{CP} = \frac{300}{320} \times 320 = \text{Rs. } 300$$

Quantity II — Let CP = 100 x

$$\text{SP} = 114x$$

$$\text{New CP} = 100x - 117$$

$$\text{New SP} = 114x - 117$$

$$\text{Profit percentage} = \frac{14x}{(100x-117)} \times 100 = 23$$

$$x = 2.99, \text{ CP} = 299 \text{ Rs.}$$

Quantity I > Quantity II

Q2. Quantity I — the sum of money for which the difference between SI and CI obtained on it in 2 years at 6% per annum compounded annually is Rs. 43.2.

Quantity II — Rs. 12850

S2. Ans. (b)

Sol.

$$\text{Quantity I — } \frac{P(6)^2}{(100)^2} = 43.2$$

$$P = 12000 \text{ Rs.}$$

Quantity II — Rs. 12850

Quantity I < Quantity II

Q3. Quantity I — average income of the whole group of 75 people, if average income of the

men in the group is Rs. 4200 and that of women is Rs. 4000. (total men : total women = 8 : 7)

Quantity II — The average income of 20 people, which decreases by Rs. 150 if a person with income of Rs. 1000 joins them.

S3. Ans. (b)

Sol.

Quantity I — men \rightarrow 40, women \rightarrow 35
Average = $\frac{40 \times 4200 + 35 \times 4000}{75} = 4106\frac{2}{3}$ Rs

Quantity II — let the average = x
 $\frac{20x + 1000}{21} = (x - 150), x = 4150$ Rs.
quantity I < quantity II

Q4. Quantity I — The distance of school from Aman's house if he reaches school 5 minutes late while walking at 4 km/hr but 10 minutes earlier than scheduled time walking at 5 km/hr.

Quantity II — 5 km

S4. Ans. (e)

Sol.

$$\frac{x}{4} - \frac{x}{5} = \frac{15}{60}, x = 5 \text{ Km}$$

Quantity I = Quantity II

Q5. Quantity I — Product of 2 numbers, whose sum is 17 and sum of the squares of 2 no. is 145.

Quantity II — Sum of 2 numbers, whose product is 1400 and difference between them is 5.

S5. Ans. (e)

Sol.

Quantity I — $x + y = 17$ (i)

$x^2 + y^2 = 145$ (ii)

Squaring both side in eq (i)

$$x^2 + y^2 + 2xy = 289$$

$$x^2 + y^2 = 145$$

$$xy = \frac{144}{2} = 72$$

Quantity II — $x(x + 5) = 1400$

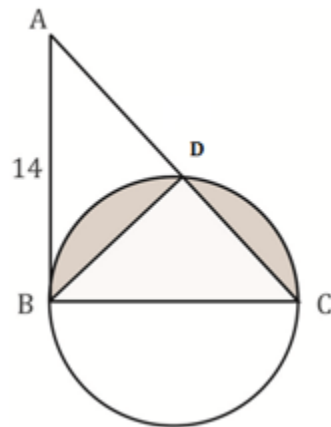
$$x = -40, x + 5 = -35$$

Or $x = 35, x + 5 = 40$, sum = - 75 or 75

5 Given that D is the midpoint of AC and BC is diameter of circle, and circumference of circle is 44cm.

quantity1- area of shaded region

quantity2- $7\pi \text{ cm}^2$



(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

5. (a) diameter of circle BC = d cm

$$\pi d = 144 \text{ cm}$$

$$d = 14 \text{ cm}$$

$$\begin{aligned} \text{Area of the semi-circle} &= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 \\ &= 77 \text{ cm}^2 \end{aligned}$$

$\triangle ABC = 2 \triangle BDC$ (D is a mid point at AC)

$$\begin{aligned} \triangle BDC &= \frac{1}{2} \times 14 \times 14 \times \frac{1}{2} \\ &= 49 \text{ cm}^2 \end{aligned}$$

$$\text{Area of the shaded region} = 77 - 49$$

$$= 28 \text{ cm}^2$$

Hence quantity I > Quantity II

6 Quantity I = $49xy$, Quantity II = $64xy^6$, if $x > 0$ & $y < 0$

(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

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6. (b) If $X > 0, Y < 0$
 $\Rightarrow XY$ Must be negative and
 XY^6 Must be positive
 Hence
 $64XY^6 > 49XY$
 So Quantity (i) < Quantity (ii)

7. Speed of a boat in still water and speed of current is in ratio 5 : 1. If the difference between distance covered by boat in 2 hours upstream and in 2 hours downstream is 8 km.

Quantity-1- Speed of boat in still water

Quantity-2- A cyclist goes 37 km in 3 hrs.

(a) quantity 1 > quantity 2

(b) quantity 1 < quantity 2

(c) quantity 1 \geq quantity 2

(d) quantity 1 \leq quantity 2

(e) quantity 1 = quantity 2 or No relation

7. (b) Let the speed of boat in still water = $5x$
 Speed of current = x
 According to Question
 $8 = 2 \{ (5x + x) - (5x - x) \}$
 $4 = 2x$
 $x = 2$
 So quantity 1 = 10 km/hr
 Quantity 2 = $\frac{37}{3} = 12\frac{1}{3}$ km/hr
 Hence
 Quantity 1 < Quantity 2

8. The total number of integers pair (x, y) satisfying the equation $x + y = xy$ is p

Quantity (Q_1):- p

Quantity (Q_2) total no. of odd prime number less than 6

(a) quantity 1 > quantity 2

(b) quantity 1 < quantity 2

(c) quantity 1 \geq quantity 2

(d) quantity 1 \leq quantity 2

(e) quantity 1 = quantity 2 or No relation

8. (e)
 Number of integer pair (X, Y) Satisfying the eqⁿ $\Rightarrow X + Y = xy$
 is $(0, 0)$ and $(2, 2)$ So quantity 1 = 2
 Total no. of prime number less than 6 = 3, 5
 Quantity 2 = 2
 Hence
 Quantity 1 = Quantity 2

9. Quantity (Q_1) = Speed of the train, if the length of train and a platform are 120m and 180m respectively and train takes 9 second to cross the platform

Quantity (Q_2):- Speed of train if it travels 200 km in 2 hr

(a) quantity 1 > quantity 2

- (b) quantity I < quantity II
 (c) quantity I ≥ quantity II
 (d) quantity I ≤ quantity II
 (e) quantity I = quantity II or No relation

9. (a) Speed of train = $\frac{300}{9}$ m/s
 $= \frac{300}{9} \times \frac{18}{5} = 120$ km/hr
 Quantity Q1 = 120 km/hr
 Quantity Q2 = $\frac{200}{2} = 100$ km/hr
 Quantity Q1 > Quantity Q2

10 Let $N = 1421 \times 1423 \times 1425$, what is the remainder when N is divided by 12 .

Quantity -1 remainder

Quantity-2 last digit of N

(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

10 (b) Quantity Q1 remainder = $\frac{1421 \times 1423 \times 1425}{12}$
 $= \frac{5 \times 7 \times 9}{12} = 3$

Quantity Q2 Last digit = $1 \times 3 \times 5 = 5$

Quantity Q2 > Quantity Q1

Q8. Quantity 1: Value of y .A vessel contains 2.5 liters of water and 10 liters of milk. 20% of the contents of the vessel are removed. To the remaining contents, x liters of water are added to reverse the ratio of water and milk. Then y liters of milk are added again to reverse the ratio of water and milk.

Quantity 2: 120 ltr.

(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

S8. Ans. (e)

Sol.

Quantity 1: Liters of milk removed = $\frac{1}{5} \times 10 = 2$ ltr.

Liters of water removed = $\frac{1}{5} \times 2.5 = 0.5$ ltr.

$$\frac{2+x}{8} = \frac{4}{1}$$

$$\Rightarrow x = 30$$

$$\frac{32}{8+y} = \frac{1}{4} \Rightarrow y = 128 - 8 = 120 \text{ ltr.}$$

Quantity 2 : 120 ltr

Quantity I = Quantity II.

Q9. P can complete a piece of work in 16 days which Q can complete in 32 days. P and Q work on alternate days.

Quantity 1: Time taken by them to complete the work if P starts on day 1.

Quantity 2: time taken by them to complete the work if Q starts on day 1.

- (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

S9. Ans. (b)

Sol.

Let, total units of work be 32 units

Then P does 2 units per day.

& Q does 1 unit per day.

Quantity 1:

3 units are done in 2 days.

30 units are done in 20 days.

On 21st day P does 2 units and work gets completed.

Quantity 2 :

3 units are done in 2 days

30 units are done in 20 days.

On 21st day Q does 1 unit work.

P completes the remaining one unit in another $\frac{1}{2}$ day

Total days = $21\frac{1}{2}$

Quantity 2 > quantity 1

Q10. The largest possible right circular cylinder is cut out from a wooden cube of edge 7 cm.

Quantity I: volume of the cube left over after cutting out the cylinder

Quantity II: Surface area of cube remained after cutting out the cylinder.

Note: compare the magnitudes of both quantities.

- (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

S10. Ans.(b)

Sol. Quantity 1 : Volume of cube left = $7^3 - \pi \left(\frac{7}{2}\right)^2 \times 7$

$$= 343 - \frac{22}{7} \times \frac{49 \times 7}{4}$$

$$= 343 - 269.5$$

$$= 73.5 \text{ cm}^3$$

Quantity 2 : Surface area of cube left = $6 \times 7^2 - 2 \cdot \pi \left(\frac{7}{2}\right)^2 + 2\pi \left(\frac{7}{2}\right) 7$

$$= 294 - 77 + 154$$

$$= 371 \text{ cm}^2$$

Quantity 2 > Quantity 1

Q11. Quantity I: Profit % made in selling each meter if the profit made in selling 20 m of a cloth equals the cost price of 5 m of that cloth.

Quantity II: Overall profit percentage if the cost prices of two shirts are equal. One shirt is sold for 20% profit and the other is sold for 10% 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

S11. Ans.(a)

Sol.

Quantity 1 : Let C.P. of one-metre cloth be Rs. x

And S.P. of one-metre cloth be Rs. y

Then,

$$20y - 20x = 5x$$

$$\Rightarrow 20y = 25x$$

$$\Rightarrow \frac{y}{x} = \frac{5}{4}$$

$$\text{Profit\%} = \frac{(5-4)}{4} \times 100 = 25\%$$

Quantity 2: Let C.P. of both shirts be Rs. 100

Total C.P. = Rs. 200

Total S.P. of both shirts = $1.2 \times 100 + 0.9 \times 100 = \text{Rs. } 210$

$$\text{Overall profit} = \frac{(210-200)}{200} \times 100 = 5\%$$

Quantity 1 > Quantity 2

Q5. Quantity I: Overall profit percentage if the cost prices of two shirts are equal. One shirt is sold for 20% profit and the other is sold for 10% loss.

Quantity II: Profit % made in selling each meter if the profit made in selling 20 m of a cloth equals the cost price of 5 m of that cloth.

- (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

S5. Ans.(b)

Sol. Quantity 1: Let C.P. of both shirts be Rs. 100

Total C.P. = Rs. 200

Total S.P. of both shirts = $1.2 \times 100 + 0.9 \times 100 = \text{Rs. } 210$

Overall profit = $\frac{(210-200)}{200} \times 100 = 5\%$

Quantity 2 : Let C.P. of one-metre cloth be Rs. x

And S.P. of one-metre cloth be Rs. y

Then,

$$20y - 20x = 5x$$

$$\Rightarrow 20y = 25x$$

$$\Rightarrow \frac{y}{x} = \frac{5}{4}$$

$$\text{Profit\%} = \frac{(5-4)}{4} \times 100 = 25\%$$

Quantity 2 > Quantity 1

Q6. The largest possible right circular cylinder is cut out from a wooden cube of edge 7 cm.

Quantity I: volume of the cube left over after cutting out the cylinder

Quantity II: Surface area of cube remained after cutting out the cylinder.

Note: compare the magnitudes of both quantities.

- (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

S6. Ans.(b)

Sol. Quantity 1 : Volume of cube left = $7^3 - \pi \left(\frac{7}{2}\right)^2 \times 7$

$$= 343 - \frac{22}{7} \times \frac{49 \times 7}{4}$$

$$= 343 - 269.5$$

$$= 73.5 \text{ cm}^3$$

Quantity 2 : Surface area of cube left = $6 \times 7^2 - 2 \cdot \pi \left(\frac{7}{2}\right)^2 + 2\pi \left(\frac{7}{2}\right) \cdot 7$

$$= 294 - 77 + 154$$

$$= 371 \text{ cm}^2$$

Quantity 2 > Quantity 1

Q7. Quantity 1: Value of y. A vessel contains 2.5 liters of water and 10 liters of milk. 20% of the contents of the vessel are removed. To the remaining contents, x liters of water are added to reverse the ratio of water and milk. Then y liters of milk are added again to reverse the ratio of water and milk.

Quantity 2: 120 ltr.

- (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

S7. Ans.(e)

Sol. Quantity 1: Liters of milk removed = $\frac{1}{5} \times 10 = 2$ ltr.

Liters of water removed = $\frac{1}{5} \times 2.5 = 0.5$ ltr.

$$\frac{2+x}{8} = \frac{4}{1}$$

$$\Rightarrow x = 30$$

$$\frac{32}{8+y} = \frac{1}{4} \Rightarrow y = 128 - 8 = 120 \text{ ltr.}$$

Quantity 2 : 120 ltr

Quantity I = Quantity II.

Q8. P can complete a piece of work in 16 days which Q can complete in 32 days. P and Q work on alternate days.

Quantity 1: Time taken by them to complete the work if P starts on day 1.

Quantity 2: Time taken by them to complete the work if Q starts on day 1.

- (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

S8. Ans.(b)

Sol. Let, total units of work be 32 units

Then P does 2 units per day.

& Q does 1 unit per day.

Quantity 1 :

3 units are done in 2 days.

30 units are done in 20 days.

On 21st day P does 2 units and work gets completed.

Quantity 2 :

3 units are done in 2 days

30 units are done in 20 days.

On 21st day Q does 1 unit work.

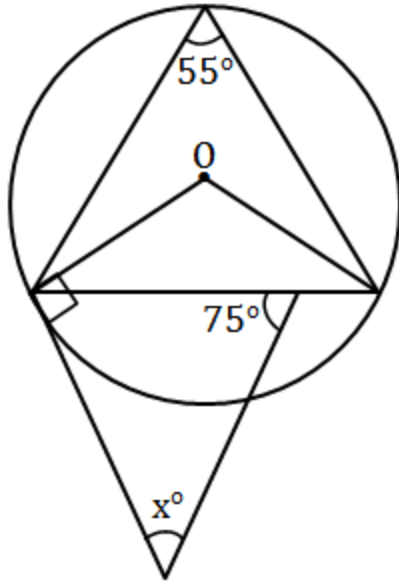
P completes the remaining one unit in another $\frac{1}{2}$ day

$$\text{Total days} = 21\frac{1}{2}$$

Quantity 2 > quantity 1

Directions (6-10): Study the given information in each question and find the relation between Quantity I and Quantity II.

Q6.



Quantity I: x°

Quantity II: 55°

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I ³ Quantity II
- (d) Quantity I = Quantity II
- (e) No relation

Q7. $(x^a)^c = x^c$

$$\frac{x^{2b}}{x^a} = (x^{5a}) \times (x^d) \times (x^b)$$

Quantity I = b

Quantity II = d

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I ³ Quantity II
- (d) Quantity I = Quantity II
- (e) No relation

Q8. $a > 0 < b$

For all the integer value of a and b

$$x = \frac{(a^2+ab)-(ab^2-b)}{2a^2+b^2-ab}$$

Quantity I: x

Quantity II: 1.5

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I ³ Quantity II
- (d) Quantity I = Quantity II
- (e) No relation

Q9. A box contains 4 Red balls, 6 white balls, 2 orange balls and 8 black balls.

Quantity I: Two balls are drawn at random probability that both balls are either red or white.

Quantity II: Three balls are drawn. The probability that all are different.

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I ³ Quantity II
- (d) Quantity I = Quantity II
- (e) No relation

Q10. The cost price of 2 items A and B is same. The shopkeeper decided to mark the price 40% more than the CP of each item. A discount of 25% was given an item A and discount of 20% was given on item B. total profit earn on both item was Rs.34

Quantity I: CP of the items

Quantity I: CP of any item which was sold at 12.5% profit and profit earned on it was sold for Rs. 50

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I ³ Quantity II
- (d) Quantity I = Quantity II
- (e) No relation

Solution :

S6. Ans.(b)

$$\text{Sol. } \angle O = 2 \times 55^\circ = 110$$

$$x^\circ = 180 - (75^\circ + (90^\circ - 35^\circ))$$

$$x^\circ = 50^\circ$$

$$\text{so, } x < 55^\circ$$

S7. Ans.(a)

Sol.

$$(x^a)^c = x^c$$

$$ac = c$$

$$a = 1$$

$$\frac{x^{2b}}{x^a} = x^{5a} \times x^d \times x^b$$

$$\text{Or, } 2b - a = 5a + d + b$$

$$b = 6a + d$$

$$b = 6 + d$$

$$\text{so, } b > d$$

S8. Ans.(b)

Sol. Let us take the value of $a = 1$ & $b = 1$ putting this in the equation we get

$$x = 1$$

$$\text{So, } x < 1.5$$

S9. Ans.(b)

Sol. Probability that both balls are either Red or White

$$= \frac{{}^4C_2 + {}^6C_2}{{}^{20}C_2} = \frac{6 + 15}{190} = \frac{21}{190}$$

Probability that both balls are of different colours (RWO, RWB, WOB and ROB)

$$= \frac{(4 \times 6 \times 2) + (4 \times 6 \times 8) + (6 \times 2 \times 8) + (4 \times 2 \times 8)}{{}^{20}C_2} = \frac{20}{57}$$

Quantity I < Quantity II

S10. Ans.(d)

Sol.	A	B
	CP	CP
MP →	1.4 CP	1.4 CP
SP →	1.4 CP × 0.75	1.4 CP × 0.80
Profit =	(1.4 × 0.75 CP + 1.4 × 0.80 CP) - 2CP	
	34 = 0.17CP	
	CP = 200	

II. CP = x

$$SP = 1.25x$$

$$1.25x - x = 25$$

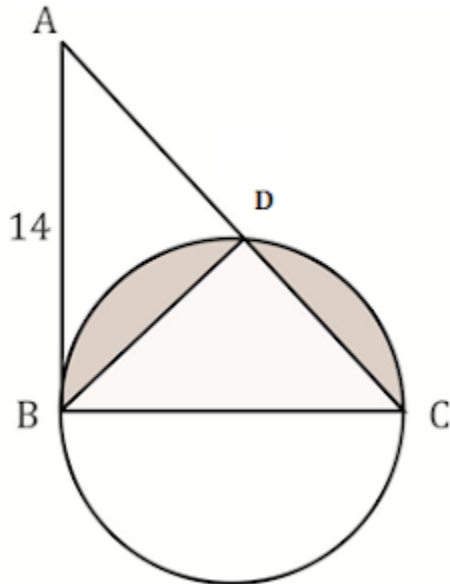
$$0.125x = 25$$

$$x = 200$$

So, quantity I = Quantity II

Directions (5-10): Study the given information in each question and find the relation between Quantity I and Quantity II.

Q5. Given that D is the midpoint of AC and BC is diameter of circle, and circumference of circle is 44cm .



Quantity I- area of shaded region

Quantity II- $7\pi \text{ cm}^2$

- (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

Q6. Quantity I = $49xy$,

Quantity II = $64xy^6$, if $x > 0$ & $y < 0$

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

Q7. Speed of a boat in still water and speed of current is in ratio 5 : 1. If the difference between distance covered by boat in 2 hours upstream and in 2 hours downstream is 8 km.

Quantity I- Speed of boat in still water

Quantity II- Speed of a cyclist goes 37 km in 3 hrs.

- (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

Q8. The total number of integers pair (x, y) satisfying the equation $x + y = xy$ is a

Quantity I - a

Quantity II - total no. of odd prime number less than 6

- (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

Q9. Quantity I - Speed of the train if the length of train and a platform are 120m and 180m respectively and train takes 9 second to cross the platform

Quantity II - Speed of train if it travels 200 km in 2 hr

- (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

Q10. $N = 1421 \times 1423 \times 1425$. The remainder when N is divided by 12 is R.

Quantity I - R

Quantity II - last digit of N

- (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

Solution :

•

The respective ratio between the present age of Mohan and David is 5:x. Mohan is 9 years younger than Preethi. Preethi's age after 9 years will be 33 years. The difference between David's and Mohan's age is same as the present age of Preethi.

Quantity I: Mohan's present age

Quantity II: The value of x

- 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 relation cannot be established

Answer

A. Quantity I > Quantity II

Explanation:

Preethi's age after 9 years = 33 years

Preethi's present age = $33 - 9 = 24$ years

Mohan's present age = $24 - 9 = 15$ years

David's present age = $15 + 24 = 39$ years

Ratio between Mohan and David = $15 : 39 = 5 : 13$

$X = 13$

• Sri invested some amount(x) at the rate of 12% simple interest and a certain amount(y) at the rate of 10% simple interest. He received yearly interest of Rs.140. But if he had interchanged the amounts invested, he would have received Rs.4 more as interest.

Quantity I: The value of x

Quantity II: The value of y

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 relation cannot be established

Answer

B. Quantity I < Quantity II

Explanation:

Amount invested at 12% = Rs. x

Amount invested at 10% = Rs. y

$$140 = x \cdot 12 \cdot 1/100 + y \cdot 10 \cdot 1/100$$

$$12x + 10y = 14000 \text{ -(i)}$$

$$144 = x \cdot 10 \cdot 1/100 + y \cdot 12 \cdot 1/100$$

$$10x + 12y = 14400 \text{ -(ii)}$$

$$x = 545.45; y = 745.45$$

• Ajith can do a piece of work in 10 days, Bala in 15 days. They work together for 5 days, the rest of the work is finished by Chand in two more days. They get Rs. 6000 as wages for the whole work.

Quantity I: What is the sum of Rs.100 and the daily wage of Bala?

Quantity II: What is the daily wage of Chand?

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 relation cannot be established

Answer

E. Quantity I = Quantity II or relation cannot be established

Explanation:

Ajith's 5 days work = 50%

Bala's 5 days work = 33.33%

Chand's 2 days work = 16.66% $[100 - (50+33.33)]$ Ratio of contribution of work of Ajith, Bala and Chand = 3 : 2 : 1

Ajith's total share = Rs. 3000

Bala's total share = Rs. 2000

Chand's total share = Rs. 1000

Ajith's one day's earning = Rs.600

Bala's one day's earning = Rs.400

Chand's one day's earning = Rs.500

• A Bike is available at 40% discount at showroom "A" and the same is available at only 25% discount at showroom "B". Mr. Arun has just sufficient amount of Rs. 60,000 to purchase it at showroom "A".

Quantity I: Difference between Marked Price and SP at Show Room "A"

Quantity II: Difference between Marked Price and SP at Show Room "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 relation cannot be established

Answer

A. Quantity I > Quantity II

Explanation:

Let the marked price be x.

Cost price (CP) = 40 % discount on MP = $0.6y = 60000$

$\Rightarrow y = \text{Rs.}100000$ MP

SP at Show Room "A" = Rs. 60000

SP at Show Room "B" = $100000 \times 0.75 = 75000$

Difference between Marked Price and SP at Show Room "A" = 40000

Difference between Marked Price and SP at Show Room "B" = 25000

• **Quantity I: $(x - 18)^2 = 0$**

Quantity II: $y^2 = 324$

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 relation cannot be established

Answer

C. Quantity I \geq Quantity II

Explanation:

$x^2 - 36x + 324 = 0$

$x = 18, 18$

$y^2 = 324$

$y = \pm 18$

• A Cistern has an inlet pipe and outlet pipe. The inlet pipe fills the cistern completely in 1 hour 20 minutes when the outlet pipe is plugged. The outlet pipe empties the tank completely in 4 hours when the inlet pipe is plugged.

Quantity I: Inlet pipe Efficiency

Quantity II: 3 times of Outlet pipe Efficiency

- 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 relation cannot be established

Answer

E. Quantity I = Quantity II or relation cannot be established

Explanation:

Inlet pipe Efficiency = $100/(8/6) = 75\%$

Outlet pipe Efficiency = $100/(4) = 25\%$

3 times of Outlet pipe Efficiency = 75%

• Harish took an educational loan from a nationalized bank for his 2 years course of MBA. He took the loan of Rs.5 lakh such that he would be charged at 7% p.a. at CI during his course and at 9% CI after the completion of the course. He returned half of the amount which he had to be paid on the completion of his studies and remaining after 2 years.

Quantity I: He returned half of the amount which he had to be paid on the completion of his studies

Quantity II: He returned remaining amount after 2 years

- 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 relation cannot be established

Answer

B. Quantity I < Quantity II

Explanation:

$5,00,000 * (1.07)^2 = 572450$

Returned amount = 286225

After two years = $286225 * (1.09)^2 = 340063$

• The average salary of the entire staff in an office is Rs 250 per month. The average salary of officers is Rs 520 and that of non-officers is Rs. 200.

Quantity I: Number of Officers = 15

Quantity II: Number of Non-Officers

- 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 relation cannot be established

Answer

B. Quantity I < Quantity II**Explanation:**

Let the required number of non-officers = x

$$200x + 520 \times 15 = 250 (15 + x)$$

$$250x - 200x = 520 \times 15 - 250 \times 15$$

$$50x = 4050$$

$$x = 81$$

• **The perimeter of a rectangle and a square is 160 cm each. If the difference between their areas is 600 cm.**

Quantity I: Area of Square

Quantity II: Area of Rectangle

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 relation cannot be established

Answer

A. Quantity I > Quantity II

Explanation:

Perimeter of rectangle = Perimeter of Square = 160

$$4a = 160 \Rightarrow a = 40$$

Area of square = 1600

$$1600 - lb = 600$$

$$lb = 1000 \text{ cm}^2$$

• **Shree started traveling from a place A to B and Priya started traveling from a place B to A which are 576 km apart. They meet after 12 hours. After their meeting, Shree increased her speed by 2 km/hr and Priya reduced her speed by 2 km/hr, they arrived at B and A respectively at the same time.**

Quantity I: Initial Speed of Shree

Quantity II: Initial Speed of Priya

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 relation cannot be established

Answer

B. Quantity I < Quantity II

Explanation:

Sum of their speeds = Distance/time = $576/12 = 48$ kmph

Respective Speed of Shree and Priya = $(23 + 25) = 48$ kmph