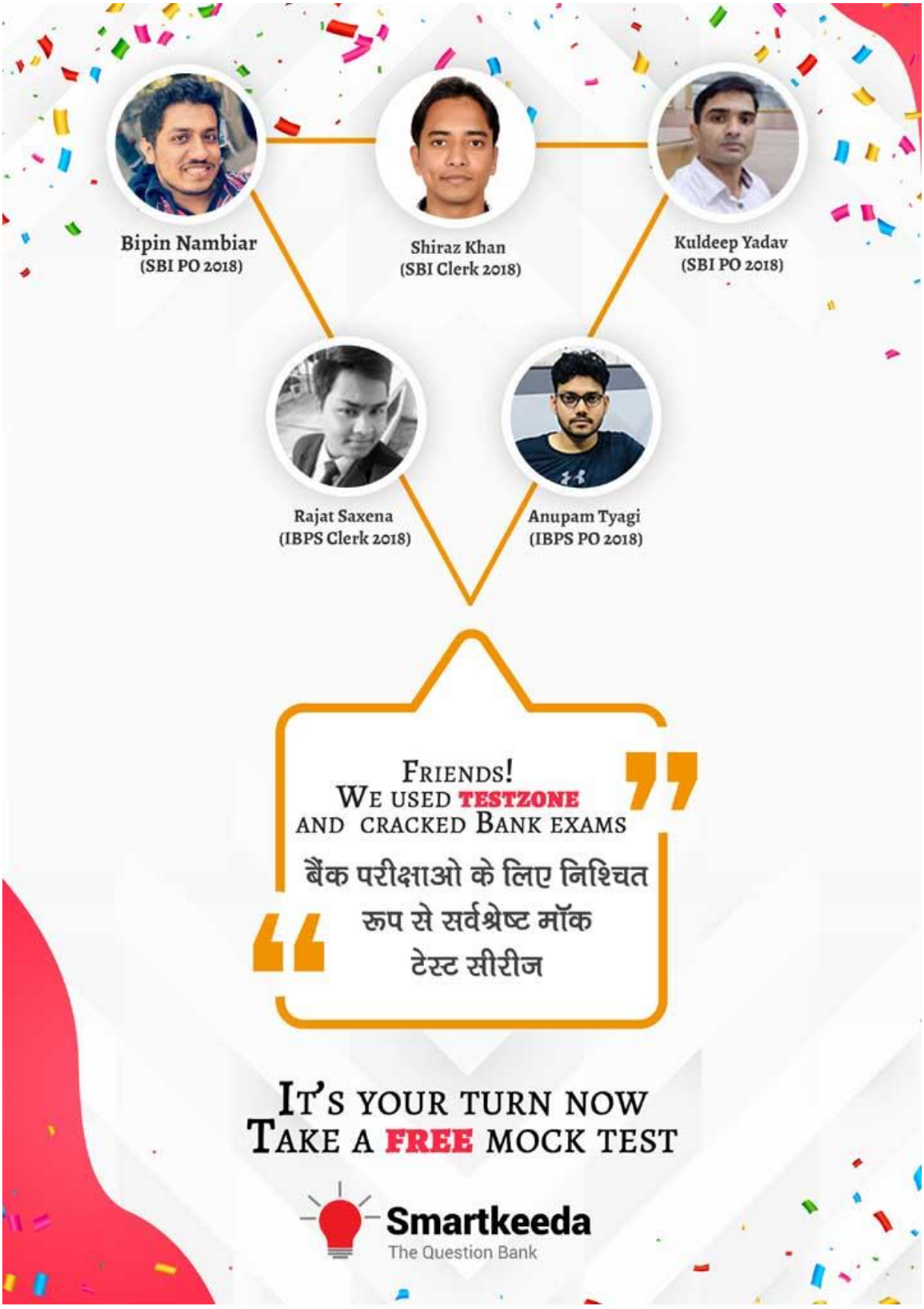
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The Question Bank

Maths Inequalities Questions for SBI Clerk Mains, IBPS Clerk Mains, SBI PO Pre and IBPS PO Pre Exams.

Maths Inequalities Quiz 17

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

1. **Quantity I :** A train can cross a pole and platform having a length of 330 m in 8 seconds and 23 seconds respectively. Find the speed of the train in km/hr.

Quantity II : When the average speed of the car is decreased by 5 km/hr, it reaches its destination 9 minutes late. Find the original average speed(in km/hr) of the car if the destination is 180 km from the starting point.

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

2. **Quantity I :** Pipes A and B individually can fill the empty tank in 20 hours and 25 hours respectively. Pipe C alone can empty the full tank in 40 hours. Pipe A is opened at the start and after 5 hours pipe B is also opened. After 4 more hours pipe C is also opened. In how many hours the tank is filled completely?

Quantity II : A and B together can do a piece of work in 6 hours. A is 50% more efficient than B. In how many hours, A alone can complete the work?

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

3. **Quantity I :** Find the remainder when 2131151 is divided by 17.

Quantity II : Find the unit digit of $17^{18^{19}}$

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

4. **Quantity I :** Mr. Shukla spent 24% of his monthly income on EMI of house and Car, 12% of his children's education, 20% and 5% of the remaining monthly income on Investment and Entertainment, respectively. If he saves Rs. 21600, then find the amount spent by Mr. Shukla on Entertainment.

Quantity II : The ratio of the monthly income of Raju and Vinesh is 4 : 3 respectively, and the respective ratio of their expenditure is 5 : 4. Raju and Vinesh save Rs. 10000 and Rs. 6000 respectively. If Vinesh gives 5% of his income to his sister, then find the amount given by Vinesh to his sister.

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

5. **Quantity I :** Sanju can beat Sanjay and Shailesh by 80 meter and 110 meter in a race of 560 m and 440 m respectively, find by what distance Sanjay will beat Shailesh in a race of 480 m?

Quantity II : The sum of areas of a rectangular park and square garden is 4300 m2. If the length and breadth of the rectangle is 50% more and 12.5% more than the side of square garden respectively then find the length of rectangular park.

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

6. **Quantity I :** Two boats are traveling towards each other in a canal. The distance between the boats is 300 km. Both boats can travel at a speed of 30 km/h in still water and the speed of the current is 5 km/h. Find the time taken by the two boats to meet each other.

Quantity II : Find the time required to cover a distance of 237 km at a speed of 50 km/h.

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

7. **Quantity I :** The cost of 3 shoes, 7 slippers and 11 sandals together is Rs. 6000, while the cost of 8 shoes, 32 sandals and 20 slippers together is Rs. 17000. Find the cost of 1 shoe, 1 slipper and 1 sandal together.

Quantity II : Cost price of 1 trouser, if cost of 13 such trousers is Rs. 12987.

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

8. **Quantity I :** Two types of materials costing Rs. 40 per kg and Rs. 60 per kg respectively are mixed in the ratio of 5: 3. Find the profit percentage earned by selling the mixture at Rs. 50.

Quantity II : Find the profit percentage on selling an article, if the cost price of the article is Rs. 899 and the selling price is Rs. 949.

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

9. **Quantity I :** Gopal and Krishna started a partnership business. Gopal invested 40% of the capital for 15 months and Krishna got 400/9% of the profit. Find the time for which Krishna invested.

Quantity II : 50% of a number is added to the same number and the resultant is multiplied by 100, then the result comes out be 1200. Find the numerical value of the number.

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

10. **Quantity I :** Find the missing number.

344, 212, 134, 48, 52, (?)

Quantity II : If $(2x^2 – 392) + (2x^2 – 2744) = 0$, then find the value of x.

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

Correct Answers:

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

Explanations:

1. **Quantity I :** Let the length of the train be 'x' m

So, the speed of the train = $\frac{x}{8}$

Also, the speed of train = $\frac{x + 330}{23}$

So, $\frac{x}{8} = \frac{x + 330}{23}$

$23x = 8x + 2640$

$15x = 2640$; $x = 176$

So, the speed of the train = $\frac{176}{8}$ = 22 m/s = 79.2 km/h

Quantity II : Let the original average speed of the car be 'x' km/h

According to the question,

$\frac{180}{x - 5} - \frac{180}{x} = \frac{9}{60}$

$x^2 - 5x - 6000 = 0$

$x^2 - 80x + 75x - 6000 = 0$

$x(x - 80) + 75(x - 80) = 0$

$(x - 80)(x + 75) = 0$

$x = 80, -75$

Speed can't be negative. So, the value of 'x' = 80

So, the original average speed of the car = 80 km/hr

So, Quantity I < Quantity II

So option (C) is the correct answer.

2. **Quantity I :** Let the capacity of the tank = 200 litres (LCM of 20, 25 and 40)

Quantity of water filled by pipe A alone in one hour

$= \frac{200}{20} = 10$ litres

Quantity of water filled by pipe B alone in one hour

$= \frac{200}{25} = 8$ litres

Quantity of water emptied by pipe C alone in one hour

$= \frac{200}{40} = 5$ litres

Quantity of water filled by pipe A alone in five hours = 10 × 5 = 50 litres

Quantity of water filled by pipe A and B together in 4 hour = (10 + 8) × 4 = 72 litres

Quantity of remaining water to be filled by pipes A, B and C together = 200 – 50 – 72 = 78 litres

Time taken by pipes A, B and C together to fill the remaining 78 litres

$= \frac{78}{10 + 8 - 5} = \frac{78}{13} = 6$ hours

So, total time taken to fill the empty tank = (5 + 4 + 6) = 15 hours

Quantity II: Let the time taken by B alone to complete the work be 'x' hours

So, the time taken by A alone to complete the work

$= \frac{x}{1.5} = \frac{2x}{3}$ hours

So, according to question,

$\frac{1}{x} + \frac{3}{2}x = \frac{1}{6}$

$\frac{5x}{2} = \frac{1}{6}$; $x = 15$

So, time taken by A alone to complete the work

$= \frac{15}{1.5} = 10$ hours

So, Quantity I > Quantity II

So option (A) is the correct answer.

3. **Quantity I :** $213^{1141} = (213^{16})^{71} \times 213^{15}$

Number	Divisor	Remainder
213^{16}	17	1
213^{1}	17	9
213^{2}	17	-4
213^{4}	17	-1
213^{8}	17	1
213^{15}	17	2

Therefore, required remainder = $(1)^{71} \times 2 = 2$

Quantity II: Unit digit of (any odd number except 5 at unit's place)^{4n} =1

$$17^{18^{19}} = 17^{2^{19} \times 9^{19}} = 17^{4 \times 2^{17} \times 9^{19}}$$

$$17^{18^{19}}$$

Therefore, unit digit of
So, Quantity I > Quantity II

So option A is the correct answer.

4. **Quantity I:** Let the monthly income of Shukla be Rs. '100x'

So, amount spends by Shukla on EMI = 0.24×100x=Rs.24x
So, amount spends by Shukla on children's education = 0.12×100x=Rs.12x
So, remaining income = (100x – 24x – 12x) = Rs.64x
So, the amount spends by Shukla on Investment and Entertainment = (0.20 + 0.05) × 64x = Rs.16x
Therefore, savings = (64x – 16x) = 48x

According to question,

48x = 21600 ; x = 45

So, income of Shukla = 100x = 45000
Therefore, the amount spends by Shukla on Entertainment = 0.05 × 64 × 450 = Rs.1440

Quantity II: Let, the income of Raju and Vinesh be Rs. '4x' and Rs.'3x' respectively

According to the question,
(4x – 10000)/(3x – 6000) = 5/4
16x – 40000 = 15x – 30000
x = 10000
So, the income of Vinesh = 3 × 10000 = 30000
Therefore, the amount is given to sister by Vinesh = 0.05 × 30000 = Rs.1500
So, Quantity I < Quantity II
So option (C) is the correct answer.

5. **Quantity I:** Let, speed of Sanju, Sanjay and Shailesh be 'A' m/s, 'B' m/s, 'C' m/s respectively.

According to question,

$$\frac{560}{A} = \frac{560 - 80}{B}$$

$$\frac{560}{A} = \frac{480}{B}$$

$$\frac{A}{B} = \frac{7}{6}$$

Also,

$$\frac{440}{A} = \frac{440 - 110}{C}$$

$$\frac{440}{A} = \frac{330}{C}$$

$$\frac{C}{A} = \frac{3}{4}$$

Using both the equations, we get

A : B : C = 28 : 24 : 21

Ratio of the speed of Sanju: Sanjay: Shailesh = 28 : 24 : 21

Distance run by Sanjay = 480 m

Distance run by Shailesh = $\frac{480}{24} \times 21 = 420$ m

So, Sanjay will beat Shailesh by (480 – 420) = 60m

Quantity II: Let, side of square garden be 'x' m

So, length of rectangular garden = 1.5x m

So, breadth of rectangular garden = 1.125m

According to the question,

$x^2 + 1.5x \times 1.125x = 4300$

$x^2 + 1.6875x^2 = 4300$

$2.6875x^2 = 4300$

$$x^2 = \frac{4300}{2.6875}$$

$x^2 = 1600$

$x = 40$ m

Therefore, length of rectangular park = 1.5 × 40 = 60m

So, Quantity I = Quantity II or No relation

So, option (E) is the correct answer.

6. **Quantity I :**

Downstream speed of the boat = 30 + 5 = 35 km/h

Upstream speed of the boat = 30 – 5 = 25 km/h

Relative speed = 35 + 25 = 60 km/h

Distance to be travelled = 300 km

Time required = $\frac{300}{60}$ = 5 hours

Quantity II :

Required time = $\frac{237}{50}$ = 4.74 hours

∴ Quantity I > Quantity II

Hence, option A is correct

.

7. **Quantity I :** Let the cost of 1 shoe, 1 slipper and 1 sandal be 'a', 'b' and 'c' respectively.

According to the question,

3a + 7b + 11c = 6000 ----(i)

8a + 20b + 32c = 17000 ----(ii)

(ii) – 2 × (i)

⇒ 2a + 6b + 10c = 5000 ----(iii)

(i) – (iii)

⇒ a + b + c = 1000

Cost of 1 shoe, 1 slipper and 1 sandal is Rs. 1000.

Quantity II :

Cost price of 1 trouser = $\frac{12987}{13}$ = Rs. 999

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

8. **Quantity I :** Let the number of kgs of the two varieties be 5a and 3a respectively.
Total cost of the mixture = 40 × 5a + 60 × 3a = Rs.380a
He sold the mixture at Rs. 50 per kg.
Total kgs of materials sold = 5a + 3a = 8a kg
Selling price = 50 × 8a = Rs. 400a
$\therefore$ Profit % = $\frac{400a - 380a}{380a} \times 100\% = \frac{100}{19}\% = 5.26\%$

Quantity II :

Reqd. profit % = $\frac{949 - 899}{899} \times 100 = 5.56\%$

$\therefore$ Quantity I < Quantity II
Hence, option C is correct.

9. **Quantity I :** Let the total profit be Rs. P.
Krishna got 400/9% or 4/9 of the total profit.
$\therefore$ Share of Krishna = Rs. $\frac{4P}{9}$

And, the share of Gopal = Rs. $P - \frac{4P}{9}$ = Rs. $\frac{5P}{9}$

$\therefore$ The ratio of their shares;
Gopal : Krishna = $\frac{5P}{9} : \frac{4P}{9} = 5 : 4$
Let the total capital be Rs. x
Gopal invested 40% or 2/5 of the capital for 15 months.
$\therefore$ The investment of Gopal = Rs. $\frac{2x}{5}$

And, the investment of Krishna = Rs $x - \frac{2x}{5}$ = Rs. $\frac{3x}{5}$

Let Krishna invested for y months.
Now we can write,
$\frac{[2x/5 \times 15]}{[3x/5 \times y]} = \frac{5}{4}$

$\Rightarrow \frac{30}{3y} = \frac{5}{4}$
$\Rightarrow 15y = 120$
$\Rightarrow y = 8$
$\therefore$ The required no. of months = 8

Quantity II : Let the number be X then,
$-1.5\ X \times 100 = 1200$
$\Rightarrow X = 8$
$\therefore$ Quantity I = Quantity II
Hence, option E is correct.

10. **Quantity I :**

The pattern of given series is:
$344 = 7^3 + 1^2$
$212 = 6^3 – (2)^2$
$134 = 5^3 + (3)^2$
$48 = 4^3 – (4)^2$
$52 = 3^3 + (5)^2$
$(?) = 2^3 – (6)^2 = -28$

Thus, the missing number is -28

Quantity II :

$(2x^2 – 392) + (2x^2 – 2744) = 0$
$\Rightarrow 4x^2 – 3136 = 0$
$\Rightarrow 4x^2 = 3136$
$\Rightarrow x^2 = 784$
$\Rightarrow x = \pm 28$

Now comparing,

-28 = -28

-28 < 28

Hence, Quantity 1 ≤ Quantity 2

Hence, option D is correct.