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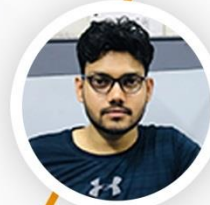
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# Maths Inequalities Questions for Bank and Insurance Exams

## Maths inequalities Quiz 1

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

### 1. What is the age of Amanpreet?

**Quantity I:** Amanpreet is 3 years younger than Mohanpreet and the ratio of their ages is 7: 8.

**Quantity II:** Average age of Meet and Amanpreet is 25 years and Meet is 2 years older than Amanpreet.

- 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

### 2. In an envelope there are 5 green, 3 yellow and 4 pink tablets. 3 tablets are picked at random

**Quantity I:** The probability that 2 tablets are yellow in colour and 1 tablet is pink in colour.

**Quantity II:** The probability that all the tablets are green in colour.

- 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

### 3. What is the volume of the cylinder?

**Quantity I:** The curved surface area of the cylinder is 220 cm<sup>2</sup> and the height of the cylinder is 2 cm less than the radius of the cylinder.

**Quantity II:** 770 cm<sup>3</sup>.

- 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

**4. Find the percentage of boys in the class this year.**

**Quantity I:** This year the percentage of girls in the class is 60%.

**Quantity II:** Last years out of the 300 students, 50% was girls and this year the number of girls are increased by 10% but total students remains same.

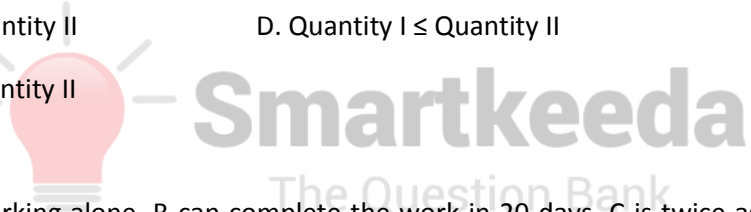
- A. Quantity I > Quantity II
- B. Quantity I < Quantity II
- C. Quantity I = Quantity II
- D. Quantity I  $\geq$  Quantity II
- E. Quantity I  $\leq$  Quantity II

**5. If a and b are natural numbers and  $7 > a > b > 3$ .**

**Quantity I:**  $4a^3b$

**Quantity II:**  $2a^2b^2$

- A. Quantity I = Quantity II
- B. Quantity I > Quantity II
- C. Quantity I < Quantity II
- D. Quantity I  $\leq$  Quantity II
- E. Quantity I  $\geq$  Quantity II



**6. Quantity I:** Working alone, B can complete the work in 20 days. C is twice as efficient as B and A takes 2 days more than it takes C to complete the work. Working together, in how much time would they be able to complete 7 such works?

**Quantity II:** Working alone, A, B and C can do a work in 24, 30 and 40 days respectively. How long will it take them to complete the work if only A and B work for the first 6 days and then C joins them?

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

**7. Quantity I:** Find the volume of a cylinder with radius 21cm and height 15 cm.

**Quantity II:** Find the volume of a sphere with radius 18 cm.

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

**8. Quantity I:** A milkman sells one - third quantity of milk what he has at a profit of 6% and the remaining milk at a profit of 15%. What is the total profit per cent for the milkman?

**Quantity II:** A boat covers a distance of 13.5 km in upstream in 1.5 hours while in downstream it covers the same distance in 54 minutes. What is the speed of boat in still water?

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

**9. Quantity I:** The distance travelled by a bus in 4 hours is 320 km. If the speed of bus is increased by 20% then what will be the time taken by bus to cover the triple of distance?

**Quantity II:** A bus which is travelling from point A to point B which are 150 km apart, covers half of distance with 25 km/h and rest of distance with 30 km/hr and take rest of 30 minutes after travelling half of distance then what will be the total time taken by bus to reach destination?

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

**10. Quantity I:** There are 3 black, 4 red and 6 blue balls in a bag. Three balls are drawn at random. What is the probability that all the balls are of different colours?

**Quantity II:** Two dice are thrown simultaneously. What is the probability that the sum of the numbers appeared in both the dice is even?

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

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### **Correct Answers:**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
C	A	C	B	B	A	C	E	A	C

### **Explanations:**

**1. Quantity I:**

Let the age of Amanpreet =  $7x$ , Mohanpreet =  $8x$

$$8x - 7x = 3$$

$$x = 3$$

Age of Amanpreet =  $7 \times 3 = 21$  years

**Quantity II:**

Total age of Amanpreet and Meet =  $25 \times 2 = 50$  years

Let the age of Amanpreet =  $x$ , Meet =  $x + 2$

$$x + x + 2 = 50$$

$$2x = 50 - 2$$

$$2x = 48$$

$$x = 24$$

Age of Amanpreet = 24 years

Quantity I < Quantity II

Hence, option C is correct.

**2. Quantity I:**

Favourable outcomes:

$$2 \text{ yellow} + 1 \text{ pink tablet} = {}^3C_2 \times {}^4C_1$$

$$= 12$$

$$\text{Total outcomes} = {}^{12}C_3$$

$$= 220$$

$$\text{Probability} = \frac{12}{220} = \frac{3}{55}$$

**Quantity II:**

Favourable outcomes:

$$3 \text{ green tablet} = {}^5C_3$$

$$= 10$$

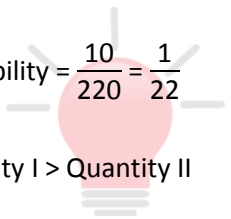
$$\text{Total outcomes} = {}^{12}C_3$$

$$= 220$$

$$\text{Probability} = \frac{10}{220} = \frac{1}{22}$$

Quantity I > Quantity II

Hence, option A is correct.



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**3. Quantity I:**

Let height =  $x$  cm, radius =  $x + 2$  cm, The curved surface area of the cylinder =  $220 \text{ cm}^2$

$$2 \pi r h = 220$$

$$2 \times \frac{22}{7} \times (x + 2) \times x = 220$$

$$x^2 + 2x = 35$$

$$x^2 + 7x - 5x - 35 = 0$$

$$x(x + 7) - 5(x + 7) = 0$$

$$(x + 7)(x - 5) = 0$$

$$x = 5, -7$$

Radius = 7 cm, Height = 5 cm

$$\text{Volume} = \pi r^2 h$$

$$= \frac{22}{7} \times 7 \times 7 \times 5 = 770 \text{ cm}^3$$

**Quantity II:**

$$= 770 \text{ cm}^3$$

Quantity I = Quantity II

Hence, option C is correct.

**4. Quantity I:**

Because percentage of girls = 60%,

So the percentage of boys =  $100 - 60\% = 40\%$

**Quantity II:**

Last year,

Girls was  $300 \times 50\% = 150$ , boys =  $300 \times 50\% = 150$

This year, because girls are increased by 10% and total students remain same.

girls =  $150 \times 110\% = 165$ , boys =  $300 - 165 = 135$

$$\% \text{ of boys} = \frac{135}{300} \times 100 = 45\%$$

Quantity I < Quantity II

Hence, option B is correct.

5. According to the question,

**If  $b = 4$ ,  $a = 5$  or  $6$**

**Quantity I:**  $a = 5$ ,  $b = 4$

$$4a^3b = 4 \times 5 \times 5 \times 5 \times 4 = 2000$$

**Quantity II:**  $a = 5$ ,  $b = 4$

$$2a^2b^2 = 2 \times 5 \times 5 \times 4 \times 4 = 800$$

**Quantity I:**  $a = 6$ ,  $b = 4$

$$4a^3b = 4 \times 6 \times 6 \times 6 \times 4 = 3456$$

**Quantity II:**  $a = 6$ ,  $b = 4$

$$2a^2b^2 = 2 \times 6 \times 6 \times 4 \times 4 = 1152$$

If  $b = 5$ ,  $a = 6$

**Quantity I:**  $a = 6$ ,  $b = 5$

$$4a^3b = 4 \times 6 \times 6 \times 6 \times 5 = 4320$$

**Quantity II:**  $a = 6$ ,  $b = 5$

$$2a^2b^2 = 2 \times 6 \times 6 \times 5 \times 5 = 1800$$

In all condition Quantity I > Quantity II

Hence, option B is correct.

6. **Quantity: I**

Time taken by B to complete the work = 20 days

Time taken by C to complete the work =  $\frac{20}{2} = 10$  days

Time taken by A to complete the work alone =  $10 + 2 = 12$  days.

Work done by A, B and C together in 1 day.

$$\Rightarrow \left( \frac{1}{20} + \frac{1}{10} + \frac{1}{12} \right) = \frac{3 + 6 + 5}{60} = \frac{14}{60}$$



this means if would take  $\frac{30}{7}$  days

for A, B and C to complete the work together

∴ Time taken A, B and C to complete

$$7 \text{ works} = 7 \times \frac{30}{7} \text{ days} = 30 \text{ days}$$

**Quantity: II** Time taken by A to complete the work = 24 days.

Time taken by B to complete the work = 30 days.

Time taken by C to complete the work = 40 days.

Work done by A and B in 1 day

$$\Rightarrow \left(\frac{1}{24} + \frac{1}{30}\right) = \frac{5+4}{120} = \frac{9}{120}$$

Work done by A and B in 6 days

$$= 6 \times \frac{9}{120} = \frac{9}{20}$$

$$\text{Remaining work} = 1 - \frac{9}{20} = \frac{11}{20}$$

Work done by A, B and C together in 1 day

$$= \left(\frac{1}{24} + \frac{1}{30} + \frac{1}{40}\right)$$

$$= \frac{5+4+3}{120} = \frac{1}{10}$$

Hence, A, B and C will complete the work in 10 days

Now, time taken by A, B and C to complete  $\frac{11}{20}$  of the work

$$= \frac{11}{20} \times 10 = 5.5 \text{ days}$$

Hence, Quantity I > Quantity II

Therefore, option (A) is correct.

7. **Quantity I:** Find the volume of a cylinder with radius 21cm and height 15 cm.

$$\text{Volume of cylinder} = \pi r^2 h = \frac{22}{7} \times 21 \times 21 \times 15 = 20790 \text{ cm}^3$$

**Quantity II:** Find the volume of a sphere with radius 18 cm

$$\text{Volume of sphere} = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \frac{22}{7} \times 18 \times 18 \times 18 = 24438.8571 \text{ cm}^3$$

Hence, Quantity I < Quantity II

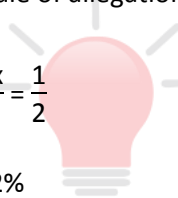
Hence, option C is correct.

8. **Quantity I:** Let total profit per cent = x%

By the rule of allegation-

$$\Rightarrow \frac{15 - x}{x - 6} = \frac{1}{2}$$

$$\Rightarrow x = 12\%$$



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**Quantity II:** Let speed of boat is 'a' km/h and speed of stream is 'b' km/h.

According to question-

$$\Rightarrow \frac{13.5}{a + b} = \frac{54}{60} \dots (1)$$

$$\Rightarrow \frac{13.5}{a - b} = 1.5 \dots (2)$$

From (1) and (2)-

$$\Rightarrow a = 12 \text{ and } b = 3$$

Hence, option (E) is correct.

9. **Quantity: I**

Distance travelled by the bus = 320 km

Time taken = 4 hours

$$\therefore \text{Speed of the bus} = \frac{320}{4} = 80 \text{ km/hr}$$

$$\text{Speed after 20\% increment} = 80 \times \frac{120}{100} = 96 \text{ km/hr}$$

Now distance need to travel =  $320 \times 3 = 960$  km

$$\therefore \text{Time take} = \frac{960}{96} = 10 \text{ hours}$$

**Quantity: II**

Distance between point A and B = 150 km

half of distance = 75 km

Time taken to cover 75 km at a speed of 25 km/hr

$$= \frac{75}{25} = 3 \text{ hours}$$

Time taken to cover 75 km at a speed of 30 km/hr

$$= \frac{75}{30} = 2.5 \text{ hours}$$

And we also know that bus took 0.5 hour rest in between.

Therefore, total time = 3 hr + 2.5 hr + 0.5 hr = 6 hours

Here, Quantity I > Quantity II

Therefore, option (A) is correct.

10. **Quantity I:** There are 3 black, 4 red and 6 blue balls in a bag. Three balls are drawn at random. What is the probability that all the balls are of different colours?

$$\text{Required probability} = \frac{{}^3C_1 \times {}^4C_1 \times {}^6C_1}{{}^{13}C_3} = \frac{36}{143}$$

**Quantity II:** Two dice are thrown simultaneously. What is the probability that the sum of the numbers appeared in both the dice is even?

Total number of outcomes =  $6 \times 6 = 36$

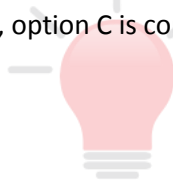
Favourable outcomes =  $\{(1,1), (1,3), (1,5), (2,2), (2,4), (2,6), (3,1), (3,3), (3,5), (4,2), (4,4), (4,6), (5,1), (5,3), (5,5), (6,2), (6,4), (6,6)\}$

No of favourable outcomes = 18

$$\text{Required probability} = \frac{18}{36} = \frac{1}{2}$$

Hence, Quantity I < Quantity II

Hence, option C is correct.



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