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

Bank PO Maths Quiz 22

Direction: Study the following questions carefully and choose the right answer.

1. My son and some of his friends were organising a picnic. They expected the expenditure to be Rs 500. They mobilised some more students. The number of children who actually went to the picnic increased by 5, the expenditure per head came down by five rupees. How many children went to the picnic?

A. 24   B. 20   C. 25   D. 28   E. None of these

2. An ancient coin is made of Bronze, an alloy contains copper and tin in the ratio 5 : 1. Another coin is made of Brass, an alloy contains copper and zinc in the ratio 2 : 3. A new coin is formed by melting bronze and brass, such that equal amounts of copper came from brass and bronze. By what percent is the quantity of zinc present, more than the quantity of tin, in the new alloy?

A. 300%   B. 650%   C. 900%   D. 65%   E. None of these

3. Ranchi - Patna Jan Shatabdi Express going from Ranchi to Patna and makes 5 stops on the way. 3 persons enter the train during the journey with 3 different tickets. How many different sets of tickets they may have had?

A. $^{15}C_3$ B. $^{12}C_3$ C. $^{15}C_9$ D. $^{12}C_9$ E. None of these

4. Dinanath walked 12 km at a certain rate of speed and then 6 km further at a rate of 0.5 km/hr faster. If he had walked the whole distance at a faster rate of speed, his time would have been 20 minute less. How long did Dinanath take to walk the distance of 18 km at his original speed?

A. 160 minutes   B. 200 minutes   C. 270 minutes   D. 320 minutes   E. None of these

5. Naveen is twice efficient as Jindal and they can do a piece of work in 15 days. Jindal started the work and after a few days Naveen joined him. They completed the work in 11 days, from the starting. For how many days they work together?
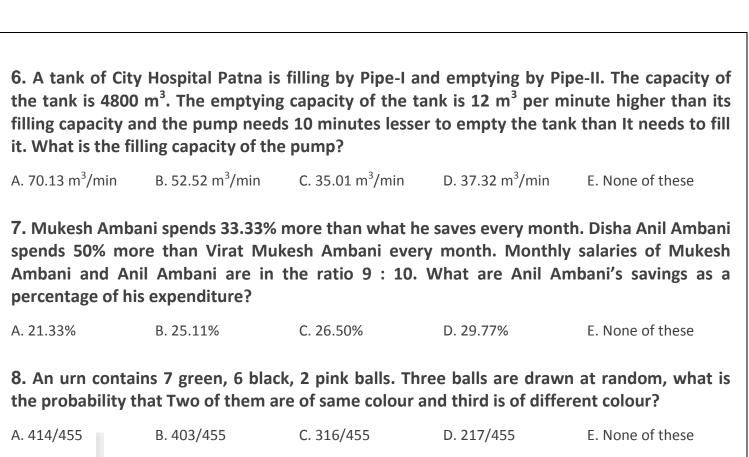
A. 6 days   B. 2 days   C. 3 days   D. 4 days   E. None of these

6. A tank of City Hospital Patna is filling by Pipe-I and emptying by Pipe-II. The capacity of the tank is 4800 m^3. The emptying capacity of the tank is 12 m^3 per minute higher than its filling capacity and the pump needs 10 minutes lesser to empty the tank than It needs to fill it. What is the filling capacity of the pump?

A. 70.13 m^3/min   B. 52.52 m^3/min   C. 35.01 m^3/min   D. 37.32 m^3/min   E. None of these

7. Mukesh Ambani spends 33.33% more than what he saves every month. Disha Anil Ambani spends 50% more than Virat Mukesh Ambani every month. Monthly salaries of Mukesh Ambani and Anil Ambani are in the ratio 9 : 10. What are Anil Ambani's savings as a percentage of his expenditure?

A. 21.33%   B. 25.11%   C. 26.50%   D. 29.77%   E. None of these

8. An urn contains 7 green, 6 black, 2 pink balls. Three balls are drawn at random, what is the probability that Two of them are of same colour and third is of different colour?

A. 414/455   B. 403/455   C. 316/455   D. 217/455   E. None of these

9. There are two containers with Ramu viz. C_1 and C_2, both containing Milk of 40% concentration. Ramu added some pure Milk to C_1 to bring the concentration to 50%. From C_2, Ramu took out some quantity of the solution and replaced it with an equal quantity of pure Milk, to bring the concentration to 50%. What is the ratio of the amount of Milk added in C_1 and C_2, if the quantity of initial solutions in C_1 and C_2 are in the ratio of 1 : 2?

A. 3 : 5   B. 2 : 5   C. 2 : 7   D. 1 : 3   E. None of these

10. Ajay can dig 12m^2 area in 2 days, working 8 hours a day while worker Bijay can dig 14m^2 in 3 days, working 6 hours a day. In a square park of area 784m^2 four equal sized largest possible circular digging job is planned. If both the workers are employed together to do the job and they both work 9 hours a day and Ajay left the job 12 days after start, on which day after the start the job got completed?

A. 86   B. 87   C. 77   D. 76   E. None of these

Correct Answers:

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

Explanations:

1. Let the no. of students initially be x

Per head expenditure $= \dfrac{500}{X}$

Now, No. of students went to picnic $\Rightarrow x + 5$

New Per head expenditure $= \dfrac{500}{(X + 5)}$

According to the question,

Per head expenditure is decreased by 5

$\Rightarrow \dfrac{500}{X} - \dfrac{500}{(X + 5)} = 5$

$\Rightarrow x^2 + 5x - 500 = 0$

$\Rightarrow x = 20, -25$ (neglected as no. of students cannot be negative)

x = 20

Hence no. of children went to the picnic = 20 + 5 = 25

Hence, option C is correct.

2. Bronze contains copper and tin in the ratio of 5 : 1.

Brass contains copper and zinc in the ratio of 2 : 3.

Let us assume x units of brass and y units of bronze are added to make the new alloy, in which the contribution of copper from brass and bronze is the same.

Contribution of copper from bronze = 5/6 y, from brass = 2/5 x

$\therefore \dfrac{5}{6}y = \dfrac{2}{5}x \Rightarrow \dfrac{x}{y} = \dfrac{25}{12}$

∴ The two alloys are mixed in the ratio 25:12 (brass : bronze)

∴ The ratio of the quantity of Zinc and quantity of tin in new alloy $= \dfrac{3}{5}(25) : \dfrac{1}{6}(12) = 15 : 2$

∴ for every 2 units of tin, 15 units of zinc is present in the alloy

∴ Zinc is 7.5 times the amount of tin or 6.5 times more than the amount of tin, i.e.,

650% more than the amount of tin.
Hence, correct option is (B)

3. Since the 3 persons are entering during the journey they could have entered at the:

1st station from where they could have bought tickets for the 2nd, 3rd, 4th or 5th stations or for Patna - total of 5 tickets.

2nd station from where they could have bought tickets for the 3rd, 4th or 5th stations or for Patna total of 4 tickets.

3rd station from where they could have bought tickets for the 4th or 5th stations or for Patna total of 3 tickets.

4th station from where they could have bought tickets for the 5th station or for Patna - total of 2 tickets.

5th station from where they could have bought a ticket for Patna - total of 1 ticket.

Thus, we can see that there are a total of 5 + 4 + 3 + 2 + 1 = 15 tickets available out of which 3 tickets were selected.

Hence this can be done in $^{15}C_3$ ways.

Hence option A is correct.

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4. Let the speed of Dinanath be x km/hr

Time taken to travel 12 km = $\dfrac{12}{x}$ hr

Time taken to travel further 6 km = $\dfrac{6}{(x + 0.5)}$ hr

Time taken to travel whole distance at faster rate = $\dfrac{18}{(x + 0.5)}$ hr

According to question,

$$\Rightarrow \left(\frac{12}{x}\right) + \left(\frac{6}{(x + 0.5)}\right) - \left(\frac{18}{(x + 0.5)}\right) = \left(\frac{20}{60}\right)$$

$$\Rightarrow \left(\frac{12}{x}\right) + \left(\frac{12}{(x + 0.5)}\right) = \left(\frac{1}{3}\right)$$

$$\Rightarrow (x + 0.5 - x) = \frac{1}{36}[x(x + 0.5)]$$

$\Rightarrow 36 \times 0.5 = x(x + 0.5)$

$\Rightarrow x^2 + 0.5x - 18 = 0$

$\Rightarrow x = 4, -4.5$

X = −4.5 is not possible

So, x = 4

Hence Dinanath will take $\dfrac{18}{4}$ = 4.5 hr

= (4.5 × 60) = 270 minutes

Hence option C is correct.

5. Let Naveen takes 'N' days to complete the work ⇒ Naveen's one day work or efficiency

$= \dfrac{1}{N}$

Let Jindal takes 'J' days to complete the work ⇒ Jindal's one day work or efficiency $= \dfrac{1}{J}$

⇒ their one day's work $= \dfrac{1}{N} + \dfrac{1}{J} = \dfrac{1}{15}$..............1

But $\dfrac{1}{N} = 2\dfrac{1}{J}$ ....(Given)

⇒ from ...1

$\dfrac{2}{J} + \dfrac{1}{J} = \dfrac{1}{15} \Rightarrow \dfrac{3}{J} = \dfrac{1}{15} \Rightarrow \dfrac{1}{J} = \dfrac{1}{45} \Rightarrow \dfrac{1}{N} = \dfrac{2}{45}$

Let after 'a' days Naveen joined him

Then $\dfrac{11}{J} + \dfrac{11-a}{N} = 1$

$\Rightarrow \dfrac{11}{45} + \dfrac{2\,(11-a)}{45} = 1$

⇒ 11 + 22 − 2a = 45 ⇒ a = 6days

⇒ number of days they worked together = 6 days

Hence, option (A) is correct.

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6. Let the filling capacity of the pump be x m³/min.

Then, emptying capacity of the pump = (x + 12) m³/min.

From question,

$\dfrac{4800}{x} - \dfrac{4800}{x+12} = 10$

Or $4800\,\dfrac{1}{x} - \dfrac{1}{x+12} = 10$

Or 4800 $\underline{x + 12 - x}$ = 10

x (x + 12)

Or $4800 \dfrac{12}{x(x+12)} = 10$

Or $\dfrac{12}{x(x+12)} = \dfrac{10}{4800}$

Or $5760 = x(x+12)$

Or $5760 = x^2 + 12x$

Or $x^2 + 12x - 5760 = 0$

We know that

$X = \dfrac{-b \pm \sqrt{(b^2 4ac)}}{2a}$

Here a = 1, b = 12 and c= −5760

So, x = $\dfrac{-12 \pm \sqrt{12^2 - 4 \times 1 \times -5760}}{2 \times 1}$

So x = $\dfrac{-12 \pm \sqrt{144 + 23040}}{2}$

So x = $\dfrac{-12 \pm \sqrt{23184}}{2}$

So x = $\dfrac{-12 \pm 152.26}{2}$

S0 x1 = $\dfrac{-12 + 152.26}{2}$

= − 6 + 76.13 = 70.13

And x^2 = $\dfrac{-12 - 152.26}{2}$

= − 6 − 76.13 = − 82.13 it will not valid because it is negative.

So x = 70.13 m^3/min.

Hence, option (A) is correct.

7. Let salary of Mukesh Ambani = Rs. 900 & salary of Anil Ambani = Rs. 1000 (salaries are in the ratio 9 : 10)

Let Mukesh Ambani saves Rs x then he spend Rs (1.33 × x)

Total salary of Mukesh Ambani = saving + expenditure = (x + 1.33 × x) = Rs. 900

⇒ x = Rs. 386.26

So, saving = Rs. 386.26 and expenditure = Rs. 513.72

Now,

Anil Ambani spend 50% more than Mukesh Ambani

So, expenditure of Anil Ambani = (1.5 × 513.72) = Rs. 770.58

Thus, saving of Anil Ambani = Rs (1000 − 770.58) = Rs. 229.42

Hence, % saving of Anil Ambani = $\dfrac{229.42}{770.58}$ × 100 = 29.77 %

Hence, option D is correct.

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8. **Case 1:** 2 green & 1 other

$$\frac{^{7}C_2 \times {}^{8}C_1}{455} = \frac{168}{455}$$

Case 2: 2 black & 1 other

$$\frac{^{6}C_2 \times {}^{9}C_1}{455} = \frac{135}{455}$$

Case 3: 2 pink & 1 other

$$\frac{^{2}C_2 \times {}^{13}C_1}{455} = \frac{13}{455}$$

Reqd. Probability = $\dfrac{168}{455} + \dfrac{135}{455} + \dfrac{13}{455} = \dfrac{316}{455}$

Hence option C is correct.

9. Let the total quantity of solution in container C_1 be x then the total quantity of Milk solution in C_2 be 2x

Now, in C_1, the concentration of the Milk solution is brought be 50% by adding extra Milk.

If Ramu adds y ml of Milk in container C_1 then

$$\frac{50}{100} = \frac{(40x/100) + y}{(x + y)}$$

$$\Rightarrow \frac{1}{2} \times (x + y) = \left(\frac{2x}{5}\right) + y$$

$$\Rightarrow \frac{x}{2} + \frac{y}{2} = \frac{2x}{5} + y$$

$$\Rightarrow \frac{x}{2} - \frac{2x}{5} = y - \frac{y}{2}$$

$$\Rightarrow \frac{x}{10} = \frac{y}{2} \quad \text{......(i)}$$

Let us assume that z liters of the second solution in container C_2 is replaced with Milk
So that the concentration becomes 50%
The final amount of Milk in the total quantity 2x is 50% i.e, x

$$x = \frac{2}{5}(2x) - \frac{2}{5}z + z$$

$$\Rightarrow x = \frac{4x}{5} + \frac{3z}{5}$$

$$\Rightarrow x - \left(\frac{4x}{5}\right) = \frac{3z}{5}$$

$$\Rightarrow \frac{x}{5} = \frac{3z}{5}$$

$$\Rightarrow z = \frac{x}{3} \quad \text{......(ii)}$$

From **(i)** and **(ii)**

$$\Rightarrow \frac{y}{z} = \frac{3}{5}$$

Hence, the required ratio be y : z = 3 : 5
Hence, option A is correct.

10. Side of square = $\sqrt{784}$ = 28

$r = \dfrac{28}{4} = 7$

Total area to be dug = $\dfrac{4 \times 22 \times 7 \times 7}{7}$ = 616 m^2

Area dug by Ajay in a day working 9 hours a day

$= \dfrac{12}{2 \times 8} \times 9 = \dfrac{27}{4}$m^2

Area dug by Bijay in a day working 9 hours a day

$= \dfrac{14}{3 \times 6} \times 9 = 7$ m^2

Total Area dug in 12 days = $\dfrac{27 \times 12}{4} + 7 \times 12 = 165$ m^2

Remaining area to be dug = 616 − 165 = 451 m^2

Thus the remaining work will be completed by Bijay working

9 hours a day in $\dfrac{451}{7}$ = 64 days 4 hour

Total number of days to complete the work = 12days + 64 days 4 hour = 76 days 4 hour

I.e., on 77th day the job completed.

Hence, option C is correct.