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7. Andy, Barney and Charlie decided to open a firm. Andy invested Rs. 14,000 for 3 months, Barney invested Rs. 12,000 for 5 months and Charlie invested Rs. 8,000 for 6 months. After starting the firm, Andy devoted 8 hours to the firm every day, Barney devoted 3 hours every day and Charlie devoted 4 hours every day, for one year. 30% of the profit is shared based on the work done by them, i.e. the number of hours one has put in. The rest of the profit is shared according to the money invested by an individual. If, at the end of the year, they earned Rs. 27,000, then what is Barney's share?

- A. Rs. 9,140 B. Rs. 9,180 C. Rs. 9,160 D. Rs. 9,100 E. None of these

8. A bag contains 21 toys numbered 1 to 21. A toy is drawn and then another toy is drawn without replacement. What is the probability that both toys are even numbered?

- A. 2/7 B. 8/21 C. 3/14 D. 5/21 E. 1/2

9. Train 'A' leaves Dadar for Chandigarh at 9 a.m. at the speed of 50 km/hr. On the same day, train 'B' leaves Dadar for Chandigarh at 1 p.m. at the speed of 75 km/hr on a parallel track. At what time will the two trains meet each other?

- A. 10 a.m. on the next day B. 9 p.m. on the same day C. 8 p.m. on the same day
D. 9 p.m. on the next day E. 8 p.m. on the next day

10. 15 kg of butter is available for cooking either idlis or dosas. 32 idlis can be made using 1 kg of batter while 24 dosas can be made using 1.5 kg of butter. If the entire available butter is used up without wastage, how many idlis and dosas can be respectively made such that the number of dosas made is twice the number of idlis?

- A. 80, 160 B. 96, 192 C. 75, 150 D. 64, 128 E. 128, 256

Correct Answers:

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

Explanations:

1. Let the sum of length of the two trains be x m and the speed (in m/s) of the faster and slower trains be a and b .

$$\therefore x/(a + b) = 15 \text{ and } x/(a - b) = 210$$

$$\therefore (a - b)/(a + b) = 15/210 = 1/14$$

$$\therefore 14(a - b) = a + b \text{ i.e. } a/b = 13/15$$

$$\therefore \text{Required percentage} = [(15 - 13)/13] \times 100 = 15.38\% \approx 15\%$$

Hence, option A is correct.

2. Let the cost of the third variety be Rs. y .
Let the three types of tea be taken in the quantities x , x and $2x$.

$$\therefore 126x + 135x + y(2x) = 153(x + x + 2x)$$

$$\therefore 261 + 2y = 153(4)$$

$$\therefore 2y = 612 - 261 = 351$$

$$\therefore y = \text{Rs } 175.5$$

Hence, option B is correct.

3. If numerators of 2 fractions are equal, then the fraction with the higher denominator is the lower fraction.

Comparing (2) & (4) i.e. $\frac{35}{44}$ and $\frac{70}{91}$

If we multiply numerator and denominator of $\frac{35}{44}$ by 2 we get

$$\frac{35 \times 2}{44 \times 2} = \frac{70}{88}$$

Now, the numerator of this new fraction & (4) are equal. But the denominator of (4) is higher.

$$\text{So, } \frac{70}{88} > \frac{70}{91} \text{ i.e. } \frac{70}{91} < \frac{35}{44}$$

Now, by observation, we can deduce that $\frac{17}{21} > \frac{18}{35}$

[Because the increase in the numerator is from 17 to 18 i.e. approximately 1%, but increase in the denominator is from 21 to 35 i.e. 66.66% increase]

So, now we left of compare $\frac{18}{35}$ and $\frac{70}{91}$

Multiply the numerator and denominator of the fraction with the denominator of the other fraction

$$\frac{18 \times 91}{35 \times 91} \qquad \frac{70 \times 35}{91 \times 35}$$

$$18 \times 91 = 1638 \qquad 70 \times 35 = 2450$$

$$\text{Hence, } \frac{18}{35} < \frac{70}{91}$$

Hence, option C is correct.

4. Since almost two women are included, there are three possibilities: 2 women + 3 men or 1 woman + 4 men or no women + 5 men.

2 women and 3 men can be selected in ${}^4C_2 \times {}^6C_3 = 120$ ways

1 woman and 4 men can be selected in ${}^4C_1 \times {}^6C_4 = 60$ ways

5 men can be selected in ${}^6C_5 = 6$ ways

\therefore Total number of ways = $120 + 60 + 6 = 186$

Hence, option B is correct.

5. A got 20% of the votes, B got 40% of the votes and 3% of the total votes were invalid.

\therefore C got 37% of the votes.

Also, C got 148 votes,

\therefore If the total number of votes is x , then $148 = 0.37 \times x$

$\therefore x = 148 \div 0.37 = 400$.

Again, as A got 20% of the votes, B (the winner) got 40% of the votes and C (the runner up) got 37% of the votes.

Thus, B won the election by a margin of just 3% of the total votes.

Hence, the winning margin is 3% of 400 = $0.03 \times 400 = 12$.

Hence, option B is correct.

6. Assume that Mathur invested Rs. 100.

\therefore Amount received = Rs. 400 and simple interest earned = $400 - 100 = \text{Rs. } 300$

$$\therefore 300 = \frac{100 \times 8 \times x}{100}$$

$$\therefore x = \frac{300}{8} = 37.5 \text{ years}$$

Hence, option A is correct.

7. 30% of 27,000 is 8100. This amount is to be shared according to the work done by them, i.e. according to the number of hours an individual has put in.

Barney puts in 3 hours every day, Andy puts in 8 hours every day and Charlie puts in 4 hours every day.

Hence Barney's share in this

$$= \frac{3 \times 8100}{3 + 8 + 4} = 1620$$

Remaining amount (i.e. Rs. 18,900) is shared based on the individual investments by the partners.

The ratio in which they have invested is as follows.

$$\begin{aligned} \text{Andy} : \text{Barney} : \text{Charlie} &= (14000 \times 3) : (12000 \times 5) : (8000 \times 6) \\ &= 42000 : 60000 : 48000 = 7 : 10 : 8 \end{aligned}$$

$$\text{Thus Barney's share} = \frac{10 \times 18900}{25} = 7560.$$

Thus Barney's total share is $1620 + 7560 = \text{Rs. } 9180$.

Hence, option B is correct.

8. There are 10 even numbers in the group 1-21.

$$\therefore \text{The probability that the first toy is even numbered} = \frac{10}{21}$$

Since the toy is not replaced there are now 20 toys left, of which 9 are even numbered.

$$\therefore \text{The probability that the second boy is even numbered} = \frac{9}{20}$$

$$\therefore \text{Reqd. probability} = \frac{10}{21} \times \frac{9}{20} = \frac{9}{42} = \frac{3}{14}$$

Hence, option C is correct.

9. Suppose two trains meet after t hrs from 1 p.m.

Distance travelled by A in $(t + 4)$ hrs is $= (t + 4) \times 50$ km

Distance travelled by B in t hrs $= t \times 75$ km

$$\therefore (t + 4) \times 50 = t \times 75$$

$$\therefore t + 4 = \frac{t \times 75}{50}$$

$$\therefore t + 4 = 1.5t$$

$$\therefore t = 8 \text{ hrs.}$$

\therefore Two trains will meet after 8 hours from 1 p.m. at $1 + 8 = 9$ hours i.e. at 9 p.m. on the same day.

Hence, option B is correct.

10. 1 kg = 32 idli and 1.5 kg = 24 dosa

Hence, 1 kg = 16 dosa

Instead of solving algebraically, you can take number of idlis and dosas from the options and see if the total batter used adds up to 15 kg (as all the batter is used without wastage).

Since 1 kg = 32 idli and 64, 96 and 128 are all multiples of 32, you can start with these options first.

$$\text{Option 4: } 64 \text{ idlis} = \frac{64}{32} = 2 \text{ kg and } 128 \text{ dosas} = \frac{128}{16} = 8 \text{ kg}$$

Since $2 + 8 \neq 15$, this option is eliminated.

Option 2: 96 idlis = 3 kg and 192 dosas = 12 kg

Since $3 + 12 = 15$ and $192 = 96 \times 2$, all the required conditions are satisfied.

Hence, option B is correct.

Note: You need not check the other options but you can verify that they are not correct.



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