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Bank PO Maths Quiz 19

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

1. The number of egg packs bought by Shawag is one more than the price, in rupees, of each egg pack. The amount of Rs.380 which Shawag had, fell short of the required amount. What is the minimum amount (in Rs.) by which he might have fallen short?

- A. 30 B. 20 C. 40 D. 10 E. None of these

2. There are two vessels V_1 and V_2 , both containing Benzene solution of 40% concentration. Marie Curie added some pure Benzene to V_1 to bring the concentration to 50%. In the vessel V_2 , Marie Curie took out some quantity of the solution and replaced it with an equal quantity of pure Benzene, to bring the concentration to 50%. What is the ratio of the amount of Benzene added in V_1 and V_2 , if the quantity of initial solutions in V_1 and V_2 are in the ratio of 1 : 2?

- A. 8 : 3 B. 3 : 5 C. 1 : 5 D. 4 : 3 E. None of these

3. Urijit Patel invested a sum of Rs.540000 in a scheme Jeevananand at the rate of 4% p.a. compound interest for three years and the rate of interest is doubled every year. At the end of second year he withdrew 50% of his total interest earned and invested in another scheme Jeevansaral which offers 15% interest p.a. What is the total interest earned on completion of three years?

- A. Rs.154215.84 B. Rs.135323.84 C. Rs.163239.84 D. Rs.164239.84 E. None of these

4. Amit Saha, Virat Kohli and Chetan Bhagat start playing a game of chance. The initial amounts with them are in the ratio 4 : 3 : 2. If Amit Saha wins he would get from Virat Kohli and Chetan Bhagat, $\frac{1}{6}$ th of their amounts before that round. If Virat Kohli wins he would get from Amit Saha and Chetan Bhagat, $\frac{1}{3}$ rd of their amounts before that round. If Chetan Bhagat wins he would get from Amit Saha and Virat Kohli, $\frac{1}{2}$ of their amounts before that round. They play 3 rounds and the 1st, 2nd and 3rd rounds are won by Amit Saha, Virat Kohli and Chetan Bhagat respectively. At the end, Chetan Bhagat gains Rs.110 overall.

What is the ratio of the total sum with Amit Saha and Virat Kohli to that with Chetan Bhagat, at the end of the 3rd round?

- A. 71 : 91 B. 42 : 91 C. 39 : 31 D. 85 : 91 E. None of these

5. 13 applicants are applying for a job in Tata Steel company, there are 5 women and 8 men. Two persons are to be selected for the job in Tata Steel . The probability that at least one of the selected persons will be a woman is

- A. $\frac{39}{25}$ B. $\frac{25}{39}$ C. $\frac{56}{156}$ D. $\frac{156}{56}$ E. None of these

6. Mahendra Rajapaksa bought a total of 15 Aircraft, BMW, and Audi for Rs.68 million. He bought more BMW than Audi. The cost of each Aircraft was Rs.8 million each BMW was Rs. 3 million and each Audi was Rs.4million. How many Aircraft did he buy?

- A. 6 B. 4 C. 1 D. 5 E. None of these

7. Fresh sugarcane contains 84% water and dried sugarcane contains 28% water. How many kilograms of dried sugarcane can be obtained from 90 kg of fresh sugarcane?

- A. 20 B. 35 C. 47 D. 72 E. None of these

8. Donald Trump goes on a tour of three cities of Japan. In every city he spends Rs.30 more than one-third of the money he has with him. At the end of the tour, he has Rs.1350 left with him. Find the amount with him before he started the tour (in Rs.)

- A. 5212 B. 4521 C. 6251 D. 4528 E. None of these

9. Tarak Mehta sold a pair of Tshirt and jeans at 25% profit. The profit obtained on Tshirt was 20%. Had he reduced the both cost price of the Tshirt and selling price of the Tshirt by Rs. 200, his profit on the pair would have risen to 30%. Earlier cost price of the jeans was Rs.80 less than half of the selling price of the Tshirt. What price should he mark on a pair of Tshirt and jeans to earn a profit of 50%?

- A. Rs. 1680 B. Rs. 1800 C. Rs. 2420 D. Rs. 2740 E. Rs. 3420

10. The difference between the diameter and the radius of a circle is 10.5 cm and the side of a square is double of the radius of the circle. What is the ratio of the area of the square to the area of the circle?

- A. 14 : 11 B. 10 : 17 C. 8 : 11 D. 13 : 15 E. None of these

Correct Answers:

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

Explanations:

1. Let the price of the egg pack be Rs. E

Then, number of packs bought = $(E + 1)$.

Hence the total cost is $E(E + 1)$.

It is given that $380 < E(E + 1)$.

If $E = 19$, the total cost = $19(20) = \text{Rs.}380$

Shawag would not have fallen short. If $E = 20$,

$E(E + 1) = 20(21) = 420$, and he would have fallen short by Rs40

This is the minimum amount by which he may have fallen short

Hence, option C is correct.

2. Let the total quantity of solution in vessel V_1 be x then the total quantity of Benzene solution in V_2 be $2x$

Now, in V_1 , the concentration of the Benzene solution is brought to 50% by adding extra Benzene.

If Marie Curie adds y ml of Benzene in vessel V_1 then

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

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

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

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

$$\Rightarrow \frac{x}{10} = \frac{y}{2} \dots \dots \dots (i)$$

Let us assume that z litres of the second solution in vessel V_2 is replaced with Benzene so that the concentration becomes 50%

The final amount of Benzene in the total quantity $2x$ is 50% i.e, x

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

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

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

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

$$\Rightarrow Z = \frac{x}{3} \dots\dots\dots (ii)$$

From (i) and (ii)

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

Hence, the ratio $y : z = 3 : 5$

Therefore, option (B) is correct.

3. Maturity Amount at the end of 1st year = $540000 \times 1.04 = \text{Rs. } 561600$

Maturity Amount at the end of 2nd year = $561600 \times 1.08 = \text{Rs. } 606528$

Total interest earned until 2nd year = $606528 - 540000 = \text{Rs. } 66528$

Amount invested in 2nd scheme = $\frac{66528}{2} = \text{Rs. } 33264$

Therefore, total maturity at the end of third year = $(606528 - 33264) \times 1.16 + 33264 \times 1.15 = 664986.24 + 38253.6 = \text{Rs. } 703239.84$

Total interest earned = $703239.84 - 540000 = \text{Rs. } 163239.84$

Hence, option (C) is correct.

4. The amounts that change hands at the end round are in terms of the fractions $(1/6)$, $(1/3)$ and $(1/2)$. Hence, if the initial amounts are represented as multiple of the LCM of 6, 3 and 2, the calculation become simple.

LCM of 6, 3 and 2 is 18

It is also given that the amounts are in the ratio of 4 : 3 : 2

Thus, they can be conveniently represented as $(4 \times 18 \times p)$, $(3 \times 18 \times p)$ and $(2 \times 18 \times p)$,

Where p is the constant of proportion

I.e. the amounts are $(72p)$, $(54p)$ and $(36p)$ for Amit Saha, Virat Kohli and Chetan Bhagat respectively.

The situation at the start as well as ends of each round is given below

Round number	Amit Saha	Virat Kohli	Chetan Bhagat
Start	72p	54p	36p
End of 1 st round	87p	45p	30p
End of 2 nd round	58p	84p	20p
End of 3 rd round	29p	42p	91p

Hence the required ratio is $(29p + 42p) : 91p$

$$= 71p : 91p$$

$$= 71 : 91$$

Hence, option (A) is correct.

5. The required probability will be given by
 First is a woman and Second is a man OR
 First is a man. And Second is a woman OR
 First is a woman and Second is a woman

$$\text{i.e. } \frac{5}{13} \times \frac{8}{12} + \frac{8}{13} \times \frac{5}{12} + \frac{5}{13} \times \frac{4}{12}$$

$$= \frac{100}{156} = \frac{25}{39}$$

Alternatively, we can define the non-event as : There are two men and no women. Then, probability of the non-event is

$$\frac{8}{13} \times \frac{7}{12} = \frac{56}{156}$$

$$\text{Hence, } P(E) = \frac{(156 - 56)}{156} = \frac{100}{156} = \frac{25}{39}$$

Hence, option B is correct.

6. Let the number of Aircraft, BMW and Audi bought by Mahendra Rajapaksa be x , y and z respectively

According to question:

$$x + y + z = 15 \dots(i)$$

$$8x + 3y + 4z = 68 \dots (ii)$$

From (ii) – (i) $\times 4$, we get

$$4x - y = 8 \dots\dots (iii)$$

From (iii),

When $y = 0$ then $x = 2$

$$\text{So, } z = (15 - 2 - 0) = 13 \text{ (from (i))}$$

The other solutions are obtained by adding 1 repeatedly to x

When $x = 3$, $y = 4$ (from (iii))

$$\text{So, } z = (15 - 3 - 4) = 8$$

When $x = 4$, $y = 8$ (from (iii))

$$\text{So, } z = (15 - 4 - 8) = 3$$

When $x = 5$, $y = 12$

$$\text{So, } z = (15 - 5 - 12) = -2 \text{ (which is not possible)}$$

Now, calculated results are given in following table

X	2	3	4
Y	0	4	8
Z	13	8	3

Since he bought at least one of each thing and more BMW than Audi,

So, third column of above table is fulfilling the required condition.

Thus, he bought 4 Aircrafts, 8 BMWs and 3 Audis.

Hence number of Aircraft = 4

Therefore, option (B) is correct.

7. The quantity of pulp (the part that is not water) in 90 kg of fresh sugarcane = $\frac{16}{100} \times 90$ kg.

This is also the quantity of pulp in the dried sugarcane formed.

Dried sugarcane have 72% pulp

$$\frac{16}{100} \times 90 = \frac{72}{100} (\text{Quantity of dried sugarcane formed}) = \frac{72}{100} \times X (\text{Say})$$

$$\Rightarrow X = 20$$

Hence, option (A) is correct.

8. Let the amount with the Donald Trump, before he started the tour of Japan be x

In the first city he spends $\frac{x}{3} + 30$

$$\text{He would be left with } x - \frac{x}{3} - 30 = \frac{2x}{3} - 30$$

at the end of the tour of the first city.

$$\text{In the second city he spends } \frac{1}{3} \times \frac{2x}{3} - 30 + 30 = \frac{2x}{9} + 20$$

$$\text{He would be left with } \frac{2x}{3} - 30 - \frac{2x}{9} - 20 = \frac{4x}{9} - 50$$

at the end of the tour of the second city.

$$\text{In the third city he spends } \frac{1}{3} \times \frac{4x}{9} - 50 + 30 = \frac{4x}{27} + \frac{40}{3}$$

$$\text{He would be left with } \frac{4x}{9} - 50 - \frac{4x}{27} - \frac{40}{3} = \frac{8x}{27} - \frac{190}{3}$$

Therefore, total amount left with him after the tour = 1350

$$\Rightarrow \frac{8x}{27} - \frac{190}{3} = 1350$$

$$\Rightarrow \frac{8x}{27} = 1350 + \frac{190}{3}$$

$$\Rightarrow \frac{8x}{27} = \frac{4240}{3}$$

$$\Rightarrow \frac{8x}{27} = 1413.33$$

$$\Rightarrow x = \frac{1413.33 \times 27}{8}$$

$$\Rightarrow x = \frac{38159.91}{8} = 4769.98 = 4770 (\text{approx})$$

Hence, the amount with the Donald Trump, before he started the tour of Japan be Rs.4770

Therefore option (E) is correct.

9. Let Cost price of each Tshirt = s

Cost price of each Jeans = p

Selling price of each Tshirt = h

And, Selling price of each Jeans = a

From question

$$h + a = 1.25 (s + p) \dots\dots(i)$$

$$h = 1.2s \dots\dots (ii)$$

$$(h + a - 200) = 1.3 (s + p - 200) \dots\dots (iii)$$

$$\text{And, } p = \frac{h}{2} - 80 \dots\dots\dots (iv)$$

Solving the above system of equation we get,

$$s = 800, p = 400, h = 960 \text{ and, } a = 540$$

$$\text{Total cost price of a pair of Tshirt and jeans} = 800 + 400 = 1200$$

$$\text{Required marked price} = 1200 \times 1.5 = \text{Rs.1800}$$

Hence, option (B) is correct.

10. Radius of the circle = x cm, diameter of the circle = 2x cm

$$2x - x = 10.5$$

$$x = 10.5 \text{ cm}$$

$$\text{Side of the square} = 10.5 \times 2 = 21 \text{ cm}$$

$$\text{Area of the square} = \text{side}^2 = 21^2 = 441$$

$$\text{Area of the circle} = \pi r^2$$

$$= \frac{22}{7} \times 10.5 \times 10.5 = 346.5 \text{ cm}$$

$$\text{Ratio} = 441 : 346.5 = 14 : 11$$

Hence, option A is correct.



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