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The Question Bank

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

Word Problems Quiz 4

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

1. In a village, two contestants (A & B) are contesting in an election. 70% of the registered voters cast their votes in the election and A wins the election by 400 votes. If A had received 12.5% less votes, A's votes would have been equal to B's votes. How many registered voters are there in the village?

A. 4500 B. 4200 C. 4000 D. 4250 E. None of these

2. A Mixture of milk and water in a vessel has milk and water in the ratio 3 : 1. 32 liters of mixture is taken out and replaced completely with milk such that the ratio of milk and water now becomes 4 : 1. What will be the quantity of water left in the mixture if 10 liters of mixture is again taken out from the vessel?

A. 24 B. 46 C. 15 D. 30 E. None of these

3. The taxi charges in a city consist of fixed charges and additional charges per kilometer. The fixed charges are for a distance of up to 5 km and additional charges are applicable per kilometer thereafter. The charge for a distance of 10 km is Rs 350 and for 25 km is Rs. 800. The charge for a distance of 30 km is-

A. Rs. 800 B. Rs. 750 C. Rs. 900 D. Rs. 950 E. None of these

4. In a square field of side 30 metres, 4 cows are grazing the field as they are tied at each of the four corners with a 14 metre long rope for each cow. What is the ungrazed area in the field?

A. 356 sq m B. 216 sq m C. 324 sq m D. 284 sq m E. None of these

5. A and B undertake a project worth Rs. 54000 . A alone can do the work in 10 days. They work together for 3 days. After 3 days, B works alone for 3 days and A completes the remaining work in 3 more days.What is the share of B in the earnings?

A. Rs. 21600 B. Rs. 33400 C. Rs. 27800 D. Rs. 35780 E. None of these

6. A box contains slips with numbers from 1 to 50 written on them. A slip is drawn and replaced. Then another slip is drawn and after replacing another slip is drawn. What is the probability that an even number appears on the first draw, an odd number on the second draw and a number divisible by 3 on the third draw?

A. $\dfrac{1}{25}$ 　　　　 B. $\dfrac{2}{25}$ 　　　　 C. $\dfrac{8}{25}$ 　　　　 D. $\dfrac{4}{25}$ 　　　　 E. None of these

7. The average salary of a company increases by 100 when the salary of the manager, which is Rs. 9500, is included. If the number of employees excluding the manager is the smallest cube divisible by 16, what is the final average of the company?

A. Rs. 4000 　　　 B. Rs. 3400 　　　 C. Rs. 3700 　　　 D. Rs. 3100 　　　 E. None of these

8. A costs twice as much as B. A is sold at a loss of 10% and B is sold at 7/5th of its price. If selling price of A is Rs. 1200 more than selling price of B, what is the cost price of A?

A. Rs. 2400 　　　 B. Rs. 3000 　　　 C. Can't be determined 　　 D. Rs. 6000 　 E. None of these

9. A sum of Rs. 5000 is compounded annually for 3 years at an interest rate of 10%. After 3 years, the interest earned is reinvested into a scheme offering simple interest of 8% for 5 years. What is the total profit earned on the whole transaction?
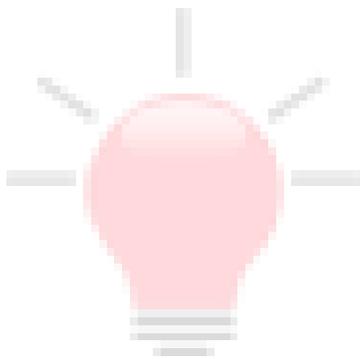
A. Rs. 2234 　　　 B. Rs. 2317 　　　 C. Rs. 2564 　　　 D. Rs. 2419 　　　 E. None of these

10. A metal cylinder with radius 24.5 cm and height 200 cm is melted into 14 spheres of equal radius. What is the volume of each sphere if during melting 10% of the metal is lost?

A. 32450 cm^3 　　 B. 21570 cm^3 　　 C. 24255 cm^3 　　 D. 25670 cm^3 　　 E. None of these

Correct Answers:

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

Explanations:

1. Let the votes received by A be x & B be y.
Now as per the given statements,
x – y = 400   **.....(1)**

Also $\left(\frac{87.5}{100}\right)x = y + \left(\frac{12.5}{100}\right)x$ **...(2)**

(The votes lost by A would go into B's account)

solving (2), we get

$y = \left(\frac{3}{4}\right)x$ **....(3)**

Using (3) to solve (1) we get

$x - \left(\frac{3}{4}\right)x = 400$

x = 1600
And, y = 1200
Now, we know that A & B collectively won 70% of total votes.
If the total number of registered voters in the village be Z,

Then, $\left(\frac{70}{100}\right)Z = 1600 + 1200 = 2800$

Z = 4000
Hence, option C is correct.

2. Initial quantity of milk in the vessel = 3x litres
Initial quantity of water = x litres

In 32 litres of mixture, Milk = $\frac{3}{4}$ × 32 = 24 liters

∴ Water = 8 litres
According to the given statements,
$\frac{(3x - 24 + 32)}{x - 8} = \frac{4}{1}$

or, 3x + 8 = 4x – 32 or x = 40
Therefore, Quantity of Water in the new mixture = x – 8 = 40 – 8 = 32 liters
Again, 10 litres of mixture is removed.

In 10 Liters of mixture, Water = $\frac{1}{5}$ × 10 = 2 liters

Hence the remaining quantity of water, i.e.
Required quantity of water = 32 – 2 = 30 liters
Hence, option D is correct.

3. Let the fixed charges = Rs. x (for the first 5 km)

and the additional charges = Rs. y /km

As per the question,

x + 5y = 350 ....(i)

x + 20y = 800 ...(ii)

On solving eqn. (i) and (ii), we get

x = 200, y = 30

∴ Charge for a distance of 30 km.

= x + 25y = 200 + 30 × 25 = Rs. 950

Hence, option D is correct.

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4. The total area of the field is 30 × 30 = 900 sq metres

The cows are can access only a quarter of what the reach of their rope as they are in a corner so all four of them graze 4 quarters

$$4 \times \frac{1}{4} \times \frac{22}{7} \times 14 \times 14 = 616$$

So the ungrazed area is 900 − 616 = 284 sq metre

Hence, option D is correct.

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5. A can do 10% work in a day. A has worked 6 days in total. And so has B
A completed 60% work in 6 days and B did 40% in 6 days.
Efficiency of A and B = 6 : 4

B's share = $\dfrac{4}{10}$ × 54000 = 21600

Hence, option A is correct.

6. The probability of an even number appearing on the first draw is 1/2(since there are 25 even numbers in counting of 1 to 50).

The probability of an odd number appearing on the second draw is 1/2(since there are 25 odd numbers in counting of 1 to 50).

The probability of a number divisible by 3 appearing on the third draw is 16/50 (since there are 16 numbers that are divisible by 3 while counting from 1 to 50.)

Since all these events have no relation with each other and no dependence either, and the slips are replaced, we can directly multiply the individual probabilities to get the resultant probability.

So, the probability of all the events taking place is

$$\frac{1}{2} \times \frac{1}{2} \times \frac{16}{50} = \frac{2}{25}$$

Hence, option B is correct.

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7. The smallest cube divisible by 16 is 64.

Lets assume the average salary before the manager's salary is included is x

After addition of Manager's salary the average increases by 100

We can write down the above information in form of an equation as:

64x + 9500 = 65 × (x + 100)

Solving for x, we get x = 3000

The final average is 3000 + 100 = Rs. 3100

Hence, option D is correct..

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8. Let the cost of B be 100x (for the sake of ease in computation)
So cost of A becomes 200x
Now SP of A becomes 90% of 200x = 180x

And SP of B becomes $100x \times \frac{7}{5}$ = 140x

The difference between both of them is 40x
Since this difference corresponds to Rs. 1200, 40x = 1200 or x = 30

There cost of A becomes 200 × 30 = Rs. 6000
Hence, option D is correct.

9. When Rs. 5000 is compounded annually for 3 years at the rate of 10% interest. the effective rate of interest for three years becomes 33.1% (Kindly refer to Sub-details) and the amount becomes:

⇒ 133.1% of 5000 = 6655

The interest earned is 6655 − 5000 = 1655
This is reinvested into another scheme offering 8% per annum for 5 years the interest become 40%
The amount becomes = 140% of 1655 = Rs. 2317

Sub details:
We can calculate the effective rate of interest by applying the net% effect formula

$= x + y + \dfrac{xy}{100}\%$

Here, x = 10% and y = 10%
So, the effective rate of interest for 1st two years will be as follows:

$= 10 + 10 + \dfrac{10 \times 10}{100} = 21\%$

Again for, 3rd year

$= 21 + 10 + \dfrac{21 \times 10}{100} = 33.1\%$

Hence, option B is correct.

10. The volume of the cylinder is $= \pi r^2 h$

$= \dfrac{22}{7} \times 24.5 \times 24.5 \times 200 = 377300$

Since 10 percent of metal is lost in the process of melting, the remaining metal is 90% of 377300 = 339570 cm^3

Since it is to be divided into 14 spheres the volume of each sphere will be

$\dfrac{339570}{14} = 24255$ cm^3

Hence, option C is correct.