

## Cognizant Placement Papers – 03

1. Find the remainder when  $(100!)^{100}$  is divided by 23?

- a) 3
- b) 2
- c) 1
- d) 0

**Answer: d) 0**

**Solution:**

We know that  $100! = 100 * 99 * 98 * \dots * 23 * 22 * 21 * \dots * 3 * 2 * 1$   
So when this equation is divided by 23, the remainder is 0.

2. One pipe can fill a bucket three times as fast as another pipe. If together the two pipes can fill the bucket in 36 minutes, then the slower pipe alone will be able to fill the bucket in:

- a) 144 minutes.
- b) 81 minutes.
- c) 108 minutes.
- d) 192 minutes.

**Answer: a) 144 minutes.**

**Solution:**

Let us assume that the slower pipe can fill the bucket in  $x$  minutes.  
So the faster tap can fill the bucket in  $x/3$  minutes.  
According to the question,  
Therefore,  
$$\frac{1}{x} + \frac{x}{3} = \frac{1}{36}$$
$$\Rightarrow x = 144 \text{ minutes.}$$

3. Aman's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. What is Aman's speed against the current?

- a) 8.5 km/hr
- b) 9 km/hr
- c) 10 km/hr
- d) 12.5 km/hr

**Answer: c) 10 km/hr**



**Solution:**

So Aman's rate in still water =  $(15 - 2.5) = 12.5$  km/hr.  
and Aman's rate against the current =  $(12.5 - 2.5)$  km/hr = 10 km/hr.

4. Seats for Mathematics, Physics and Biology in a school are in the ratio 5:7:8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

- a) 6:7:8
- b) 2:3:4
- c) 6:8:9
- d) None of the above

**Answer: b) 2:3:4**

**Solution:**

Let the ratios of division be =  $5x:7x:8x$   
There is an increase of 40%, 50% and 75% respectively.  
Therefore, applying the % over the ratio we get,  $7x:21x/2:14x$   
So, this is the required ratio.  
=  $14x : 21x : 28x$   
=  $2 : 3 : 4$

5. A hollow iron pipe is 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weighs 8 g/cm<sup>3</sup>, then the weight of the pipe is:

- a) 3.6 kg
- b) 3.696 kg
- c) 36 kg
- d) 36.9 kg

**Answer: b) 3.696 kg**

**Solution:**

Given the external diameter = 8 cm. Therefore, the radius = 4 cm.  
The thickness = 1 cm. Therefore the internal radius =  $4 - 1 = 3$  cm  
The volume of the iron =  $\pi * (R^2 - r^2) * \text{length}$   
=  $22/7 * [(4^2) - (3^2)] * 21$  cubic-cm  
= 462 cubic-cm  
Therefore, the weight of iron =  $462 * 8$  gm = 3.696 kg

6. Rohit's father is three times elder than Rohit. After 8 years, he would be two and a half times of Rohit's age. After a further 8 years, how many times would he be of Rohit's age?



- a) 2 times
- b) 2.5 times
- c) 2.75 times
- d) 3 times.

**Answer: a) 2 times**

**Solution:**

Let Rohit present age be  $x$  years  
Therefore father's age is  $x + 3x = 4x$  years  
According to the question,  
 $4x + 8 = \frac{5}{2}(x + 8)$   
 $\Rightarrow 3x = 24$   
 $\Rightarrow x = 8$   
So the answer is:  $(4x + 16) / (x + 16) = 48/24 = 2$

7. A tap can fill a bucket in 6 hours. After half the bucket is filled, three more similar taps are opened. What is the total time taken to fill the bucket completely?

- a) 3 hrs 45 min
- b) 3 hrs 15 min
- c) 4 hrs 15 min
- d) 4 hrs 45 min

**Answer: a) 3 hrs 45 min**

**Solution:**

Time is taken by one tap to fill half the bucket = 3 hours  
So the part filled 4 taps in one hour =  $4 * (1/6) = 2/3$  of the bucket.  
Therefore, the remaining part is =  $(1 - 1/2) = 1/2$   
Proportionally =  $2/3 : 1/2 :: 1 : x$   
 $\Rightarrow x = 3/4$  hours = 45 minutes. So the total time = 3 hrs 45 minutes.

8. A ship, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. What is the speed of the stream in km/hr?

- a) 4
- b) 6
- c) 5
- d) 10

**Answer: c) 5**



**Solution:**

Let the speed of the stream be  $x$  km/hr.  
Therefore the, speed of downstream =  $(15 + x)$  km/hr,  
and speed of upstream =  $(15 - x)$  km/hr.  
According to the question,  
 $30/(15 + x) + 30/(15 - x) = 9/2$   
or,  $900/(225 - x^2) = 9/2$   
or,  $9x^2 = 225$   
or,  $x^2 = 25$   
or,  $x = 5$  km/hr.

9. In a mixture 60 litres, the ratio of milk to water is 2:1. If this ratio is to be 1:2, then what is the quantity of water needed to be further?

- a) 60 litres
- b) 50 litres
- c) 40 litres
- d) 30 litres

**Answer: a) 60 litres**

**Solution:**

From the given ratio we can deduce the quantity of milk as =  $60 * (2/3) = 40$  lit  
and the quantity of water =  $60 - 40 = 20$  lit  
The new ratio must be 1:2  
Let the quantity of water to be added be  $x$  lit.  
Then milk:water =  $40 / (20 + x)$   
This should be equal to =  $1/2$   
 $\Rightarrow 20 + x = 80$   
or,  $x = 60$

10. A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is:

- a) 720
- b) 1200
- c) 900
- d) 1800

**Answer: b) 1200**

**Solution:**

According to the question,



$$2(15 + 12) * h = 2(15 * 12)$$

$$\Rightarrow h = (180/27) = 20/3 \text{ meter}$$

Therefore, the volume =  $l * b * h = (15 * 12 * 20/3)$  cubic-meter = 1200 (answer)

