

TCS Latest Placement Paper Questions with solutions -2014 (13)

1. If $f(f(n)) + f(n) = 2n + 3$ and $f(0) = 1$, what is the value of $f(2012)$?

- a) 2011
- b) 2012
- c) 2013
- d) 4095

Ans: Option C

Put $n = 0$

Then $f(f(0)) + f(0) = 2(0) + 3 \Rightarrow f(1) + 1 = 3 \Rightarrow f(1) = 2$

Put $n = 1$

$f(f(1)) + f(1) = 2(1) + 3 \Rightarrow f(2) + 2 = 5 \Rightarrow f(2) = 3$

Put $n = 2$

$f(f(2)) + f(2) = 2(2) + 3 \Rightarrow f(3) + 3 = 7 \Rightarrow f(3) = 4$

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$f(2012) = 2013$

2. If $5+3+2=151022$, $9+2+4=183652$, then $7+2+5=?$

Ans: 143547

If the given number is $a + b + c$ then $a.b \mid a.c \mid a.b + a.c - b$

$\Rightarrow 5+3+2 = 5.3 \mid 5.2 \mid 5.3 + 5.2 - 3 = 151022$

$\Rightarrow 9+2+4 = 9.2 \mid 9.4 \mid 9.2 + 9.4 - 2 = 183652$

$7+2+5 = 7.2 \mid 7.5 \mid 7.2 + 7.5 - 2 = 143547$

3. The savings of employee equals income minus expenditure. If the income of A, B, C are in the ratio 1:2:3 and their expense ratio 3:2:1 then what is the order of the employees in increasing order of their size of their savings?

Ans: $A < B < C$

As the ratio of their incomes are in ascending order, and their expenses are in descending order, their savings also in their incomes order.

So savings order = $A < B < C$

4. Entry fee is Re.1. there are 3 rides each is of Re.1. total boys entering are 3000. total income is Rs.7200. 800 students do all 3 rides. 1400 go for atleast 2 rides. none go the same ride twice. then no of students who do not go any ride is?

Ans: 1000

Total entries are 3000 So fee collected through entry fee = $3000 \times 1 = \text{Rs.}3000$

Income generated through rides = $7200 - 3000 = 4200$

Now 800 went for 3 rides so total fee paid by these 800 = $800 \times 3 = 2400$

$(1400 - 800)$ went for 2 rides so fee paid by these 600 = $600 \times 2 = 1200$

Assume K went for exactly 1 ride

Then $K \times 1 + 1200 + 2400 = 4200 \Rightarrow K = 600$

So number of boys who did not go for any ride = $3000 - (600 + 600 + 800) = 1000$

5. The average mark obtained by 22 candidates in an examination is 45. The average of the first ten is 55 while the last eleven is 40 .The marks obtained by the 11th candidate is ?

Ans: 0

It is clear that $22 \times 45 = 10 \times 55 + K + 11 \times 40 \Rightarrow K = 0$

6. What is the largest positive integer n for which 3^n divides 44^{44} ?

Ans: n = 0

The digit sum of 44^{44} is when remainder obtained 44^{44} divided by 9

$$44^{44} = (45 - 1)^{44}$$

Each term is a multiple of 9 but the last term which is $(-1)^{44}$

So the digit sum of 44^{44} is 1.

Now the divisibility rule for 3, 9, 27... is the sum of the digits should be divisible by 3, 9, 27 respectively. In each case the digit sum is either multiple of 3 or 9.

So for any value of $n > 1$, the given expression is not divisible by 3^n

7. $1(1!)+2(2!)+3(3!).....2012(2012!) = ?$

Ans: 2013!-1

$$1(1!)=1 \Rightarrow 2!-1$$

$$1(1!)+2(2!)=1+4=5 \Rightarrow 3!-1$$

$$1(1!)+2(2!)+3(3!)=1+4+18=23 \Rightarrow 4!-1$$

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$$1(1!)+2(2!)+3(3!)+.....+2012(2012!)=2013!-1$$