Quant 1 Mahayagya

14 Questions
Time: 8 mins

1. A tailor has 48.5 meters of cloth and he has to make 8 pieces out of a metre of cloth. How many pieces can he make out of this cloth?
a. 388 b. 384 c. 380 d. 333 e. 374

2. Which of the following is divisible with 3?
a. 5656561
b. 99999991
c. 111111111
d. 33333122
e. 389479834758934

3. What is the percentage of the number from 1 to 50 whose square end in one digit?
a. 20 b. 30 c. 10 d. 5 e. 7

4. What is the Lcm of the numbers 128 and 148
a. 12 b. 4736 c. 78 d.1224 e. 6789

5. 100100 is a six-digit number It is divisible by.... from the following options.
a. 9 b. 11 and 13 c. 11 and 7 d. 7,11 and 13
e. 13 and 7

6. The number 101101 is divided by 7777. The difference of divisor and remainder is?
a. 13 b. 12 c. 11 d. 10 e. 9

7. The LCM of 128 and 149 is
a. 4736 b. 19072 c. 1280 d. 1480 e. 640

8. Three numbers are in ratio 1 : 2 : 3 and HCF is 12. The numbers are:
A. 12, 24, 36
B. 11, 22, 33
C. 12, 24, 32
D. 5, 10, 15
E. None of these

9. If a, b and c are positive integers such that ab = 432 bc = 96 and c < 9, then the smallest possible value of a + b + c is:
a)59 b)38 c)49 d)56 e)46

10. What is the remainder if 1920-2019 is divided by 7:
a)1 b)5 c)7 d)0 e)3

11. Determine, as to how many distinct positive integer-valued solutions exist to the equation:
(x^2 - 7x + 11)(x^2 - 13x + 42) = 1
a)0 b)6 c)4 d)2 e)8

12. Which among the following is the smallest 7 digit number that is exactly divisible by 43?
a)1000043 b)1000048 c)1000051 d)1000006
e)1000008

13. Determine the mean of all 4-digit even natural numbers of the form 'aabb', where a > 0
a)4840 b)5544 c)5050 d)4466 e)4864

14. Determine as to how many numbers are there which are less than 100 and that cannot be written as a multiple of a perfect square greater than 1:
a)62 b)59 c)60 d)64 e)61

Solutions

1. Solution :- A
1m = 8 pieces
48.5 = X
X = 48.5 x 8/1 = 388

2. Solution :- C
Divisibility rule of 3 is that the total of individual numbers should be divisible by 3 so
1+1+1+1+1+1+1+1+1=9

3. Solution:- A
We use cyclicity to do it easily all the number that end in 1 have squares that end in 1 then 9 ending also give as 1 in the ending (cyclicity) Making a set
1,11,21,31,41,9,19,29,39,49 total = 10
10/50 x 100 = 20

4. Solution:-B 128 and 148 lcm = 4736

5. Solution = D
7 x 11 x 13 x 100 = 100100

6. Solution = A
7777 x 13 = 101101

7. Solution:- C = LCM = 128 * 149 => LCM = 19072
So, the least common multiple (LCM) of 128 and 149 is 19072.

8. Solution A
Since, the numbers are given in the form of ratio that means their common factors have been cancelled.
Each one's common factor is HCF.
And here HCF = 12,
hence, the numbers are 12, 24 and 36.

9. SOLUTION[E]-
bc = 96
c < 9
Possible factors can be 48*2,32*3,24*4, 16 * 6 ,12*8
ab = 432
Possible factors can be (closest observation 9 * 48 ,18*24
From the above
a = 18
b = 24
c = 4
So, a + b + c = 46
.. The smallest value can be 46

10. SOLUTION[B]
Using Fermat's theorem:
If p is a prime number and a, p are co primes (ap-1) mod p = 1
Remainder when 1920 is divided by 7 = 192 mod 7=4. (Here 19 ^ 20 = ((19) ^ 6) ^ 3 * (19) ^ 2 Since the remainder for 196 is 1 the remainder for 1920 is equivalent to the 192 = 4.
Remainder when 2019 is divided by 7 = 20^1 mod 7 =6.(Here 20 the remainder is 1 and since 20 ^ 19 = (20 ^ 6) ^ 3 * (20) ^ 1 = (1 * 20)/7 The remainder is 6.
Remainder when 1920-2019 is divided by 7-4-6=-2=> 5.

11. SOLUTION-[B]
12. SOLUTION[E]
13. SOLUTION[B] The four digit even numbers will be of form:
1100, 1122, 1144 ... 1188, 2200, 2222, 2244 ... 9900, 9922, 9944, 9966, 9988
Their sum 'S' will be
(1100+1100+22+1100+44+1100+66+1100+88)+(2200+2200+22+2200+44+...)....+(9900+9900+22+9900+44+9900+66+9900+88)
=>
S=1100*5+(22+44+66+88)+2200*5+(22+44+66+88)....+9900*5+(22+44+66+88)
=> S=5*1100(1+2+3+...9)+9(22+44+66+88)
=>S=5*1100*9*10/2 + 9*11*20
Total number of numbers are 9*5=45
.. Mean will be S/45 = 5*1100+44-5544

14. SOLUTION[E]61

List all multiples of perfect squares (without repeating any number) and subtract this from 99.
4- there are 24 multiples of 4 (4,8,12,.....96)
9- there are 11 multiples, 2 common with 4 (36 and 72) so, add 9 multiples
160 new multiples
25-3 new multiples (25,50,75)

360 new ones
49249,98}
64-0
81-0
Total multiples of perfect squares are 38. There are 99 numbers in total. So, there are 61 numbers that are not multiples of perfect squares.