Q1 (20 July 2021 Shift 1)

There are 15 players in a cricket team, out of which 6 are bowlers, 7 are batsmen and 2 are wicketkeepers. The number of ways, a team of 11 players be selected from them so as to include at least 4 bowlers, 5 batsmen and 1 wicketkeeper, is ___

Q2 (22 July 2021 Shift 1)

If the digits are not allowed to repeat in any number formed by using the digits $0, 2, 4, 6, 8$, then the number of all numbers greater than 10,000 is equal to

Q3 (25 July 2021 Shift 1)

There are 5 students in class 10,6 students in class 11 and 8 students in class 12. If the number of ways, in which 10 students can be selected from them so as to include at least 2 students from each class and at most 5 students from the total 11 students of class 10 and 11 is 100k, then k is equal to

Q4 (25 July 2021 Shift 2)

If ${}^{n}P_{r} = {}^{n}P_{r+1}$ and ${}^{n}C_{r} = {}^{n}C_{r-1}$, then the value of r is equal to:

(1) 1

(2) 4

(3) 2

(4) 3

Q5 (27 July 2021 Shift 2)

Let n be a non-negative integer. Then the number of divisors of the form $''4n + 1''$ of the number

$(10)^{10} \cdot (11)^{11} \cdot (13)^{13}$ is equal to

Answer Key

Q1 (777) **Q2** (96) **Q3** (238) **Q4** (3)

Q5 (924)

Q1

15 : Players

6 : Bowlers

7: Batsman

2 : Wicket keepers

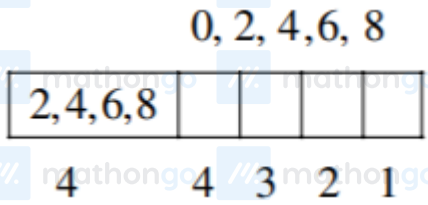
Total number of ways for :

at least 4 bowlers, 5 batsman &1 wicket keeper

$= {}^{6}C_{4}{}^{7}C_{6} \times {}^{2}C_{1} + {}^{7}C_{5} \times {}^{2}C_{2}) + {}^{6}C_{5} \times {}^{7}C_{5} \times {}^{2}C_{1}$

$= 777$

Q2



$\Rightarrow 4 \times 4 \times 3 \times 2 = 96$

Q3

Class 10^{th} 11^{th} 12^{th} Total student $5 \quad 6 \quad 8\ 2 \quad 3 \quad 5 \Rightarrow {}^{5}C_{2} \times {}^{6}C_{3} \times {}^{8}C_{5}$

Number of selection $2 \quad 2 \quad 6 \Rightarrow {}^{5}C_{2} \times {}^{6}C_{2} \times {}^{3}C_{6}$

$3 \quad 2 \quad 5 \Rightarrow {}^{5}C_{3} \times {}^{6}C_{2} \times {}^{8}C_{5}$

$\Rightarrow$ Total number of ways $= 23800$ According to question $100\ K = 23800$

$\Rightarrow K = 238$

Q4

${}^{n}P_{t} = {}^{n}P_{t+1} \Rightarrow \frac{n!}{(n-r)!} = \frac{n!}{(n-r-1)!}$

$\Rightarrow (n - r) = 1 \quad ...(1)$

${}^{n}C_{t} = {}^{n}C_{t-1}$

$\Rightarrow \frac{n!}{r!(n-r)!} = \frac{n!}{(r-1)!(n-r+1)!}$

$\Rightarrow \frac{1}{r(n-r)!} = \frac{1}{(n-r+1)(n-r)!}$

$\Rightarrow n - r + 1 = r$

$\Rightarrow n + 1 = 2r$ ...(2)

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

Q5

$N = 2^{10} \times 5^{10} \times 11^{11} \times 13^{13}$

Now, power of 2 must be zero,

power of 5 can be anything,

power of 13 can be anything.

But, power of 11 should be even.

So, required number of divisors is

$1 \times 11 \times 14 \times 6 = 924$