

Questions with Answer Keys

MathonGo

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

Permutation Combination

JEE Main 2021 (July) Chapter-wise Questions

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Answer Key

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

Q5 (924)  mathego  mathego  mathego  mathego  mathego  mathego  mathego

#MathBoltToMathOnGo

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Hints and Solutions

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Q1 mathongo mathongo mathongo mathongo mathongo mathongo mathongo

15 : Players mathongo mathongo mathongo mathongo mathongo mathongo mathongo

6 : Bowlers mathongo mathongo mathongo mathongo mathongo mathongo mathongo

7: Batsman mathongo mathongo mathongo mathongo mathongo mathongo mathongo

2 : Wicket keepers mathongo mathongo mathongo mathongo mathongo mathongo mathongo

Total number of ways for :

at least 4 bowlers, 5 batsman & 1 wicket keeper

$$= {}^6C_4 {}^7C_6 \times {}^2C_1 + {}^7C_5 \times {}^2C_2 + {}^6C_5 \times {}^7C_5 \times {}^2C_1 = 777$$

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Q2 mathongo mathongo mathongo mathongo mathongo mathongo mathongo

0, 2, 4, 6, 8

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2, 4, 6, 8

mathongo 4 3 2 1

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

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Q3 mathongo mathongo mathongo mathongo mathongo mathongo mathongo

Class 10th 11th 12th Total student 5 6 8 2 3 5 $\Rightarrow {}^5C_2 \times {}^6C_3 \times {}^8C_5$

Number of selection 2 2 6 $\Rightarrow {}^5C_2 \times {}^6C_2 \times {}^3C_6$

3 2 5 $\Rightarrow {}^5C_3 \times {}^6C_2 \times {}^8C_5$

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

$\Rightarrow K = 238$

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Q4

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

$$\Rightarrow (n-r) = 1 \dots (1)$$

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

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

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

$$\Rightarrow n - r + 1 = r$$

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

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

Q5 mathongo / mathongo / mathongo / mathongo / mathongo / mathongo / mathongo

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

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

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

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