सफलता की शुरुआत
सिर्फ मोशन के साथ...

IOQM

2021 - 2022

ANSWER KEY

Toll Free : 1800-212-1799
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मोशन के परिणाम ही है, सफलता का प्रमाण

JEE MAIN 2021 RESULT

Students Qualified for **JEE ADVANCED** **2994/4087** = **73.25%**

JEE ADVANCED 2021 RESULT

24 Student Under 500

41 Student Under 1000

Motion's Selection **1256/2994** = **41.95%**

NEET 2020 RESULT

Above 650 Marks **12**

Above 625 Marks **47**

Above 600 Marks **137**

Students Qualified **2663 / 2843** = **93.66%**

अब मोशन ही है सर्वोत्तम विकल्प !

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(LV Sir)
Deputy Director
Exp. : 19 yrs

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(AB Sir)
Deputy Director
Exp. : 19 yrs

Dr. Ashish Maheshwari
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Exp. : 21 yrs

Jitendra Chandwani
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Deputy Director
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G. S. Tiwari
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Exp. : 20 yrs

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(AV Sir)
Joint Director
Exp. : 16 yrs

Shantanu Gupta
(SG Sir)
Sr. Faculty
Exp. : 11 yrs

Harmeet S. Bindra
(Harmeet Sir)
Sr. Faculty
Exp. : 25 yrs

Renu Singh
(RNS Ma'am)
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Exp. : 18 yrs

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Dr. Deepak Garg
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Exp. : 6 yrs

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(SKY Sir)
Sr. Faculty
Exp. : 9 yrs

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Exp. : 8 yrs

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Exp. : 5 yrs

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(SM Sir)
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Exp. : 6 yrs

Deepak Bulani
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Exp. : 7 yrs

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Exp. : 6 yrs

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Exp. : 16 yrs

Gavesh Bhardwaj
(GB Sir)
Exp. : 17 yrs

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(RRD Sir)
Joint Director
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(NS Sir)
Head JEE Academics
Exp. : 17 yrs

Aatish Agarwal
(AA Sir)
Sr. Faculty
Exp. : 17 yrs

Jayant Chittora
(JC Sir)
Sr. Faculty
Exp. : 16 yrs

Anurag Garg
(AG Sir)
Sr. Faculty
Exp. : 17 yrs

Arjun Gupta
(Arjun Sir)
Sr. Faculty
Exp. : 14 yrs

Devki Nandan Pathak
(DN Sir)
Sr. Faculty
Exp. : 13 yrs

Avinash Kishore
(AVN Sir)
Sr. Faculty
Exp. : 9 yrs

Vipin Sharma
(VS Sir)
Sr. Faculty
Exp. : 12 yrs

Sanjeev Kumar
(Sanjeev Sir)
Sr. Faculty
Exp. : 8 yrs

Pramod Pottar
(Pramod Sir)
Sr. Faculty
Exp. : 7 yrs

Durgesh Pandey
(Pandey Sir)
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Exp. : 8 yrs

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1. Three parallel lines L_1, L_2,L_3 are drawn in the plane such that the perpendicular distance between L_1 and L_2 is 3 and the perpendicular distance between L_2 and L_3 is also 3. A square ABCD is constructed such that A lies on L_1, B lies on L_3 and C lies on L_2. Find the area of the square.

Sol. **(45 sq. unit)**

2. Ria writes down the numbers 1, 2, ……. , 101 in red and blue pens. The largest blue number is equal to the number of numbers written in blue and the smallest red number is equal to half the number of numbers written in red. How many numbers did Ria write with red pen ?

Sol. **(68)**

3. Consider the set T of all triangles whose sides are distinct prime numbers which are also in arithmetic progression. Let $\Delta \in T$ be the triangle with the least perimeter. If a° is the largest angle of Δ and if L is its perimeter, determine the value of $\frac{a}{L}$.

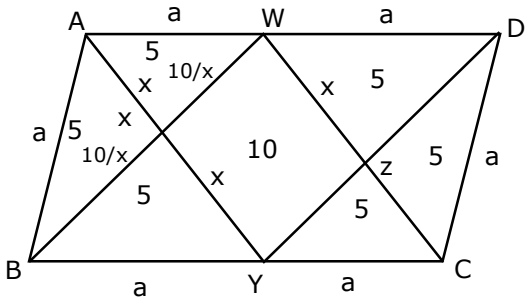
Sol. **(8)**

4. Consider the set of all 6-digit numbers consisting of only 3 digits, a, b, c, where a, b, c are distinct. Suppose the sum of all these numbers is 593999406. What is the largest remainder when the three digit number abc is divided by 100 ?

Sol. **(98)**

5. In parallelogram ABCD the longer side is twice the shorter side. Let XYZW be the quadrilateral formed by the internal bisectors of the angles of ABCD. If the area of XYZW is 10, find the area of ABCD.

Sol. **(40)**



6. Let x, y, z be positive real numbers such that $x^2 + y^2 = 49$, $y^2 + yz + z^2 = 36$ and $x^2 + \sqrt{3}\,xz + z^2 = 25$. If the value of $2xy + \sqrt{3}\,yz + zx$ can be written as $p\sqrt{q}$ where p.q are integers and q is not divisible by square of any prime number, find p + q.

Sol. **(30)**

7. Find the number of maps f : {1, 2, 3} $\rightarrow$ {1, 2, 3, 4, 5} such that f(i) $\leq$ f(j)b whenever i < j.

Sol. **(35)**

8. For any real number t, let [t] denote the largest integer $\leq$ t. Suppose that N is the greatest integer such that $\left[\sqrt{[\sqrt{[\sqrt{n}]}]}\right] = 4$. Find the sum of digits of N.

Sol. **(24)**

9. Let $P_O = (3, 1)$ and define $P_{n+1} = (x_n . y_n)$ of $n \geq 0$ by

$$x_{n+1} = \frac{3x_n - y_n}{2} \quad , y_{n+1} = \frac{x_n + y_n}{2}$$

Find the area of the quadrilateral formed by the points P_{96}, P_{97}, P_{98}, P_{99}.

Sol. **(8)**

10. Suppose that P is the polynomial of least degree with integer coefficients such that $P(\sqrt{7} + \sqrt{5}) = 2(\sqrt{7} - \sqrt{5})$. Find P(2).

Sol. **(40)**

11. In how many ways can four married couples sit in a merry-go-round with identical seats such that men and women occupy alternate seats and no husband seats next to his wife ?

Sol. **(12)**

12. A 12 × 12 board is divided into 144 unit squares by drawing lines parallel to the sides. Two rooks placed on two unit squares are said to be non attacking if they are not in the same column or same row. Find the least number N such that if N rooks are placed on the unit squares, one rook per square, we can always find 7 rooks such that no two are attacking each other.

Sol. **(73)**