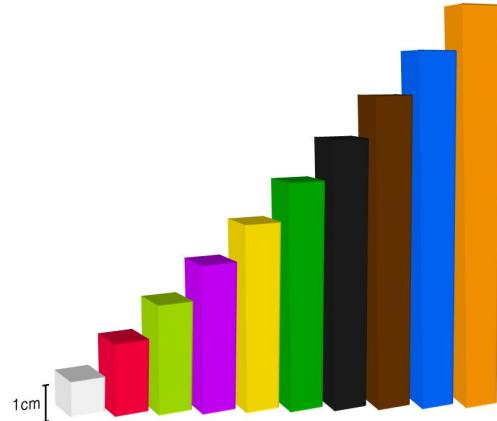


# Sequences and Series

JPP 1



Sameer Chincholikar

## Sameer Chincholikar

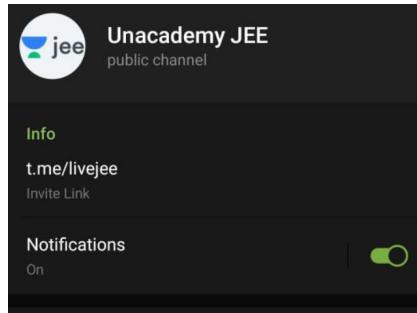
### B.Tech, M.Tech - IIT-Roorkee

- ✓ 10+ years Teaching experience
- ✓ Taught 1 Million+ Students
- ✓ 100+ Aspiring Teachers Mentored





## Telegram Channel



Search



### Sameer Chincholikar ✅

#1 Educator in Mathematics - IIT JEE

#Follow for JEE Advanced and JEE Main Courses #10+ years of experience online  
#Mentor to Aspiring JEE teachers # IIT Roorkee

Follow

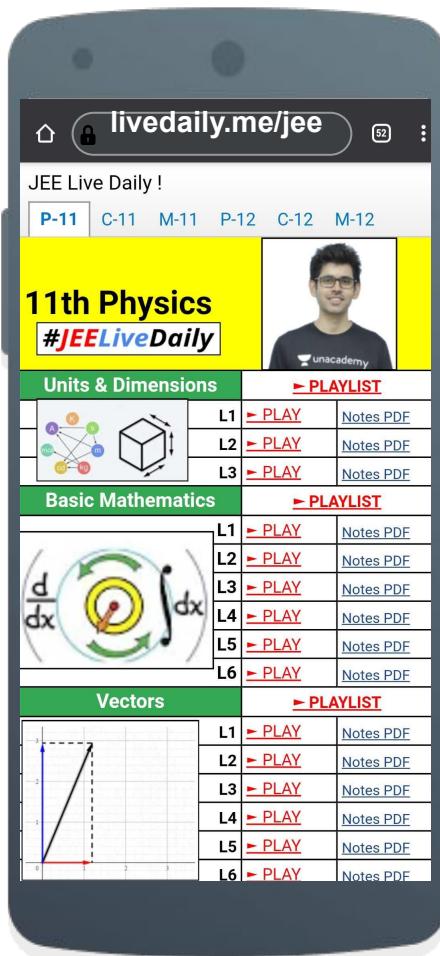
49M Watch mins

2M Watch mins (last 30 days)

79K Followers

10K Dedications





# Unacademy Subscription

Question

A shell is fired from a point O at an angle of 60 degrees with a speed of  $40 \text{ m/s}$  & it strikes a horizontal plane through O at a point A. The gun is fired a second time with the same angle of elevation but a different speed  $v$ . If it strikes the same point A, then the speed  $v$  has to be  $9\sqrt{3} \text{ m/s}$ , at the same instant, as the shell is fired. (Take  $g = 10 \text{ m/s}^2$ )

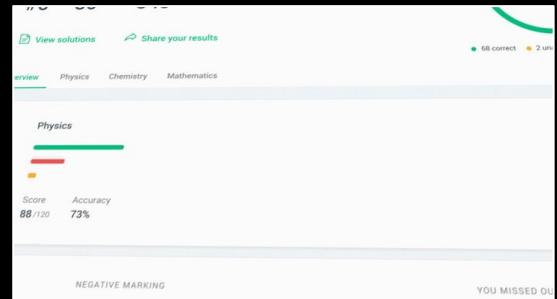
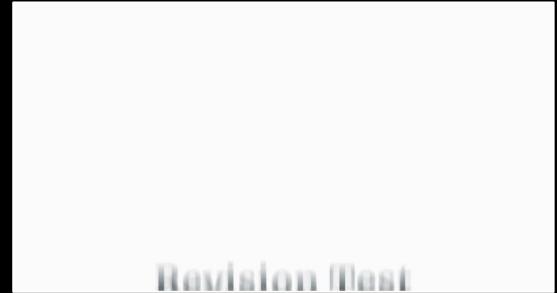
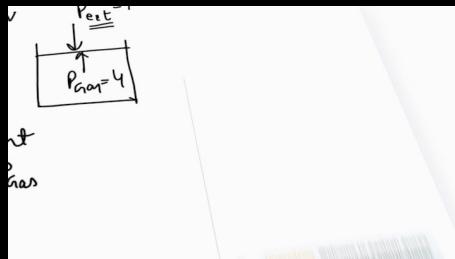
Self Inductance

As 'I' changes, 'Φ' changes and emf is induced  
this emf is called **'Self-induced emf'**  
as emf is induced because of ' $\Phi$  of loop itself.'

Corresponding induced emf

$$\epsilon = -L \frac{di}{dt}$$

L units : Volt-sec/Ampere  
use code JAYANT to enroll for Plus!



## + LIVE Class Environment

- + **LIVE Polls & Leaderboard**
- + **LIVE Doubt Solving**
- + **LIVE Interaction**

## + Performance Analysis

- + **Weekly Test Series**
- + **DPPs & Quizzes**

# + India's BEST Educators

# Unacademy Subscription

**LIVE •**

HINDI BATCHES AND YEAR LONG CO...

Course on Functions and Inverse Trigonometric Functions

Starts on Apr 7, 2021 • 24 lessons

Sameer Chincholikar

**BATCH**

**LIVE •**

HINDI

Evolve Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 7

Anupam Gupta and 2 more

**BATCH**

**LIVE •**

HINDI

Mega Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 6

Narendra Avasthi and 1 more

**BATCH**

**LIVE •**

HINDI

Enthuse: Class 12th for JEE Main and Advanced 2022

Starts on Apr 14

Amarnath Anand and 2 more

**BATCH**

**LIVE •**

HINDI

Final Rapid Revision Batch for JEE Main 2021

Starts on Apr 6

Manoj Chauhan and 2 more

**plus**

**LIVE •**

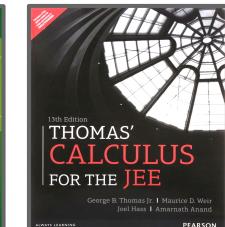
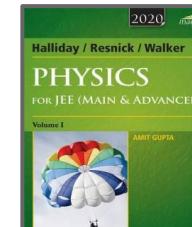
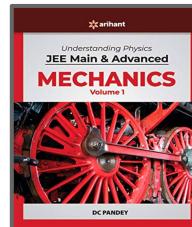
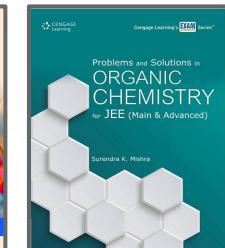
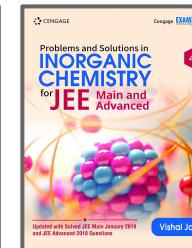
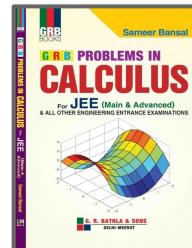
HINDI PHYSICS

Course of 12th syllabus Physics for JEE Aspirants 2022: Part - I

Lesson 1 • Apr 2, 2021 12:30 PM

D C Pandey

If you want to be the **BEST**  
“Learn” from the **BEST**





jee

# Top Results



Bratin Mondal

100 %ile



Amaiya Singhal  
99.97



Adnan  
99.95



Ashwin Prasanth  
99.94



Tanmay Jain  
99.86



Kunal Lalwani  
99.81



Utsav Dhanuka  
99.75



Aravindan K  
Sundaram  
99.69



Manas Pandey  
99.69



Mihir Agarwal  
99.63



Akshat Tiwari  
99.60



Sarthak  
Kalankar  
99.59



Vaishnavi Arun  
99.58



Devashish Tripathi  
99.52



Maroof  
99.50



Tarun Gupta  
99.50



Siddharth Kaushik  
99.48



Mihir Kothari  
99.39



Sahil  
99.38



Vaibhav Dhanuka  
99.34



Pratham Kadam  
99.29



Shivam Gupta  
99.46



Shrish  
99.28



Yash Bhaskar  
99.10



Subhash Patel  
99.02



Ayush Kale  
98.85



Ayush Gupta  
98.67



Megh Gupta  
98.59



Naman Goyal  
98.48



MIHIR PRAJAPATI  
98.16

X

## IIT JEE subscription

PLUS    ICONIC \*

- India's Best Educators
- Interactive Live Classes
- Structured Courses & PDFs
- Live Tests & Quizzes
- Personal Coach
- Study Planner

24 months                    ₹2,100/mo >  
No cost EMI                 +10% OFF ₹50,400

18 months                    ₹2,363/mo >  
No cost EMI                 +10% OFF ₹42,525

12 months                    ₹2,888/mo >  
No cost EMI                 +10% OFF ₹34,650

6 months                    ₹4,200/mo >  
No cost EMI                 +10% OFF ₹25,200

3 months                    ₹5,250/mo >  
+10% OFF ₹15,750

1 month                    ₹6,200/mo >

11<sup>th</sup> / 9, 1012<sup>th</sup> / Drop

SAMEERLIVE

X

X

## IIT JEE subscription

PLUS    ICONIC \*

 India's Best Educators Interactive Live Classes Structured Courses & PDFs Live Tests & Quizzes Personal Coach Study Planner

24 months

₹3,750/mo

No cost EMI

11<sup>th</sup> / 9, 10

18 months

₹4,000/mo

No cost EMI



12 months

₹4,875/mo

No cost EMI

12<sup>th</sup> / Drop

6 months

₹5,700/mo

No cost EMI



To be paid as a one-time payment



SAMEERLIVE





If the roots of the equation  $x^3 - 12x^2 + 39x - 28 = 0$  are in A.P. ,  
then their common difference is:

A.  $\pm 1$

B.  $\pm 2$

C.  $\pm 3$

D.  $\pm 4$



If  $S_1$  is the sum of an arithmetic series of ' $n$ ' odd number of terms and  $S_2$ , the sum of the terms of the series in odd places then  $S_1/S_2 =$

A.  $\frac{2n}{n+1}$

B.  $\frac{n}{n+1}$

C.  $\frac{n+1}{2n}$

D.  $\frac{n+1}{n}$



The sum of  $n$  terms of ' $m$ ' A.P.'s are  $S_1, S_2, S_3, \dots, S_m$ . If the first term and common difference are  $1, 2, 3, \dots, m$  respectively, then  $S_1 + S_2 + S_3 + \dots + S_m =$

- A.  $(\frac{1}{4}) mn (m + 1)(n + 1)$
- B.  $(\frac{1}{2}) mn (m + 1)(n + 1)$
- C.  $mn (m + n) (n + 1)$
- D. None of these



The sum of positive terms of the series

$$10 + 9 \frac{4}{7} + 9 \frac{1}{7} + \dots \text{ is}$$

- A.  $352/7$       B.  $437/7$       C.  $852/7$       D. None of these



The interior angles of a polygon are in A.P. If the smallest angle is **120°** and the common difference is **5**, then the number of sides of the polygon is

- A. 16
- B. 8
- C. 9
- D. None of these



If  $a_m$  be the  $m^{\text{th}}$  term of an A.P., then

$$a_1^2 - a_2^2 + a_3^2 - a_4^2 + \dots + a_{2n-1}^2 - a_{2n}^2 =$$

A.  $\frac{n-1}{2n-1}(a_1^2 - a_{2n}^2)$

B.  $\frac{n}{2n-1}(a_{2n}^2 - a_1^2)$

C.  $\frac{n}{2n-1}(a_1^2 - a_{2n}^2)$

D. None of these



If  $a$  is the first term,  $d$  the common difference and  $S_k$  the sum to  $k$  terms of an A.P., then for  $S_{kx}/S_x$  to be independent of  $x$

- A.  $a = 2d$
- B.  $a = d$
- C.  $2a = d$
- D. None of these



If  $a_1, a_2, \dots, a_n$  are in A.P. with common difference  $d \neq 0$ , then the sum of the series  $\sec a_1 \sec a_2 + \sec a_2 \sec a_3 + \dots \sec a_{n-1} \sec a_n$  is

- A.  $\csc a_n - \csc a_1$
- B.  $\cot a_n - \cot a_1$
- C.  $\sec a_n - \sec a_1$
- D.  $\tan a_n - \tan a_1$



## Example

The value of  $x$  in  $(-\pi, \pi)$  which satisfies the equation

$$8(1 + |\cos x| + |\cos^2 x| + |\cos^3 x| + \dots \infty) = 4^3 \text{ is}$$

A.  $\frac{\pi}{3}$

B.  $-\frac{\pi}{3}$

C.  $\frac{2\pi}{3}$

D. All of these



## Example

The sum of 50 terms of the sequence **7, 7.7, 7.77, 7.777, .....** is

A.  $\frac{8}{81} \left\{ 4490 + \frac{1}{10^{49}} \right\}$

B.  $\frac{7}{81} \left\{ 4490 + \frac{1}{10^{49}} \right\}$

C.  $\frac{5}{81} \left\{ 4490 + \frac{1}{10^{49}} \right\}$

D. None of these



## Example

Sum of the series  $(1 + x) + (1 + x + x^2) + (1 + x + x^2 + x^3) + \dots$  upto n terms

A.  $\frac{1}{1-x} \left[ n - \frac{x^2(1-x^n)}{1-x} \right]$

B.  $\frac{1}{1-x} \left[ n - \frac{x^3(1-x^n)}{1-x} \right]$

C.  $\frac{1}{1-x} \left[ n - \frac{x(1-x^n)}{1-x} \right]$

D. None of these



## Example

Let  $S_n$  denotes the sum of n terms of an A.P. whose first term is a.  
if the common difference  $d = S_n - k S_{n-1} + S_{n-2}$  then k =

- A. 1
- B. 2
- C. 3
- D. None of these



## Example

For  $0 < \phi < \pi/2$ , if  $x = \sum_{n=0}^{\infty} \cos^{2n} \phi$ ,  $y = \sum_{n=0}^{\infty} \sin^{2n} \phi$ ,  $z = \sum_{n=0}^{\infty} \cos^{2n} \phi \sin^{2n} \phi$

A.  $xyz = xz + y$

B.  $xyz = xy + z$

C.  $xyz = x + y + z$

D.  $xyz = yz + x$



## Example

Three numbers form an increasing GP. if the middle number is doubled, then the new numbers are in A.P. The common ratio of GP. is

- A.  $2 - \sqrt{3}$
- B.  $2 + \sqrt{3}$
- C.  $\sqrt{3} - 2$
- D. 2



# #JEELiveDaily Schedule



11<sup>th</sup>



Namo Sir | Physics

6:00 - 7:30 PM



Ashwani Sir | Chemistry

7:30 - 9:00 PM



Sameer Sir | Maths

9:00 - 10:30 PM

12<sup>th</sup>



Jayant Sir | Physics

1:30 - 3:00 PM



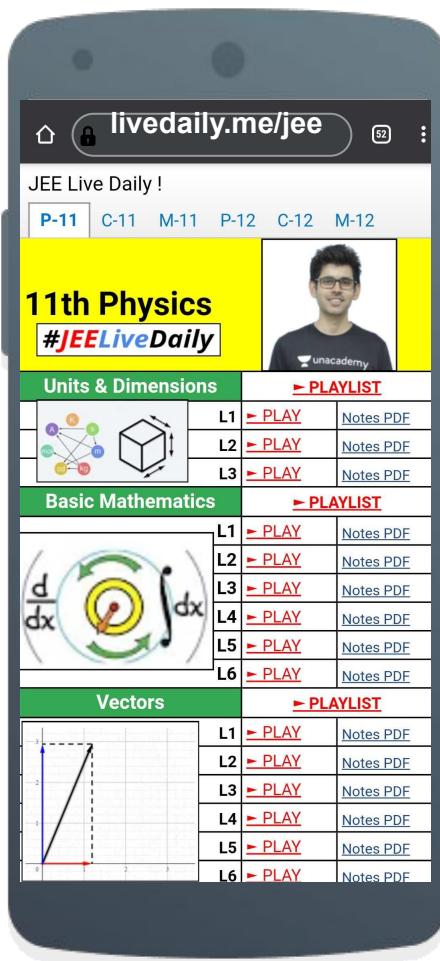
Anupam Sir | Chemistry

3:00 - 4:30 PM



Nishant Sir | Maths

4:30 - 6:00 PM



# Unacademy Subscription

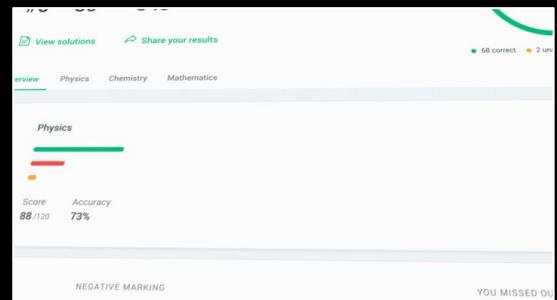
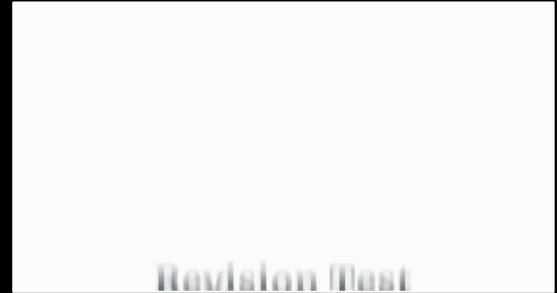
The first screenshot shows a live class interface with a teacher video feed, student names (Brijesh, Sagar, Sonwab), and a question about projectile motion.

The second screenshot shows a physics exercise titled "Self Inductance". It includes a diagram of a circular loop with current  $I$ , text explaining self-induced emf, and the formula  $e = -L \frac{di}{dt}$ .

The third screenshot shows a handwritten note with a diagram of a rectangle and the text  $P_{\text{ext}} = 4$ .

## LIVE Class Environment

- + **LIVE Polls & Leaderboard**
- + **LIVE Doubt Solving**
- + **LIVE Interaction**



## Performance Analysis

- + **Weekly Test Series**
- + **DPPs & Quizzes**

# + India's BEST Educators

# Unacademy Subscription

**LIVE •** Hindi BATCHES AND YEAR LONG CO...  
Course on Functions and Inverse Trigonometric Functions  
Starts on Apr 7, 2021 • 24 lessons  
Sameer Chincholikar

**BATCH** LIVE • Hindi Evolve Batch Course for Class 12th JEE Main and Advanced 2022  
Starts on Apr 7  
Anupam Gupta and 2 more

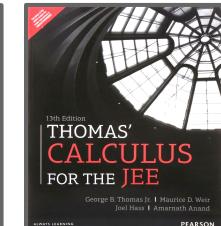
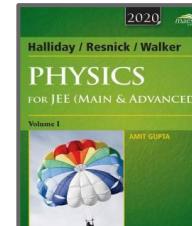
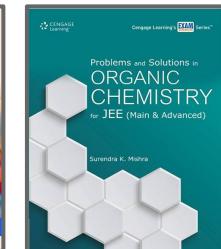
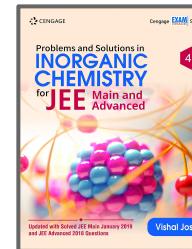
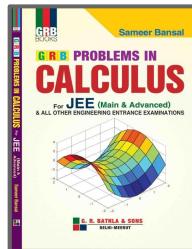
**BATCH** LIVE • Hindi Mega Batch Course for Class 12th JEE Main and Advanced 2022  
Starts on Apr 6  
Narendra Avasthi and 1 more

**BATCH** LIVE • Hindi Enthuse: Class 12th for JEE Main and Advanced 2022  
Starts on Apr 14  
Amarnath Anand and 2 more

**BATCH** LIVE • Hindi Final Rapid Revision Batch for JEE Main 2021  
Starts on Apr 6  
Manoj Chauhan and 2 more

**plus** LIVE • Hindi PHYSICS Course of 12th syllabus Physics for JEE Aspirants 2022: Part - I  
Lesson 1 • Apr 2, 2021 12:30 PM  
D C Pandey

If you want to be the **BEST**  
“Learn” from the **BEST**





jee

# Top Results



Bratin Mondal

100 %ile



Amaiya Singhal  
99.97



Adnan  
99.95



Ashwin Prasanth  
99.94



Tanmay Jain  
99.86



Kunal Lalwani  
99.81



Utsav Dhanuka  
99.75



Aravindan K  
Sundaram  
99.69



Manas Pandey  
99.69



Mihir Agarwal  
99.63



Akshat Tiwari  
99.60



Sarthak  
Kalankar  
99.59



Vaishnavi Arun  
99.58



Devashish Tripathi  
99.52



Maroof  
99.50



Tarun Gupta  
99.50



Siddharth Kaushik  
99.48



Mihir Kothari  
99.39



Sahil  
99.38



Vaibhav Dhanuka  
99.34



Pratham Kadam  
99.29



Shivam Gupta  
99.46



Shrish  
99.28



Yash Bhaskar  
99.10



Subhash Patel  
99.02



Ayush Kale  
98.85



Ayush Gupta  
98.67



Megh Gupta  
98.59

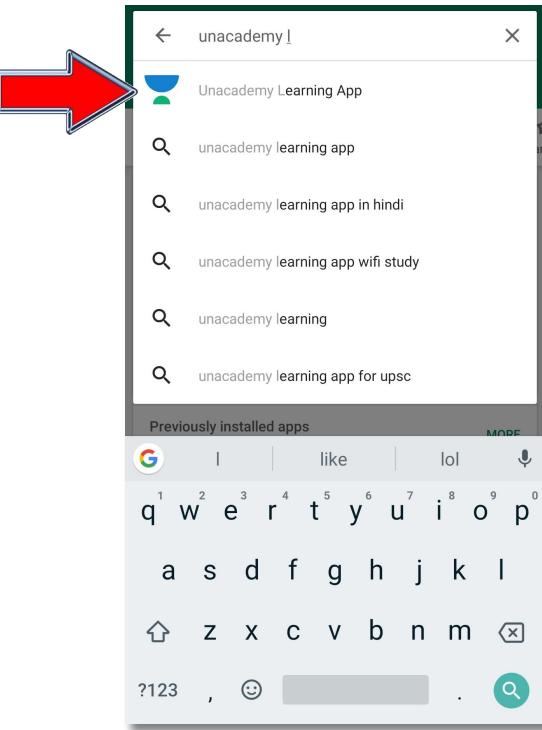


Naman Goyal  
98.48

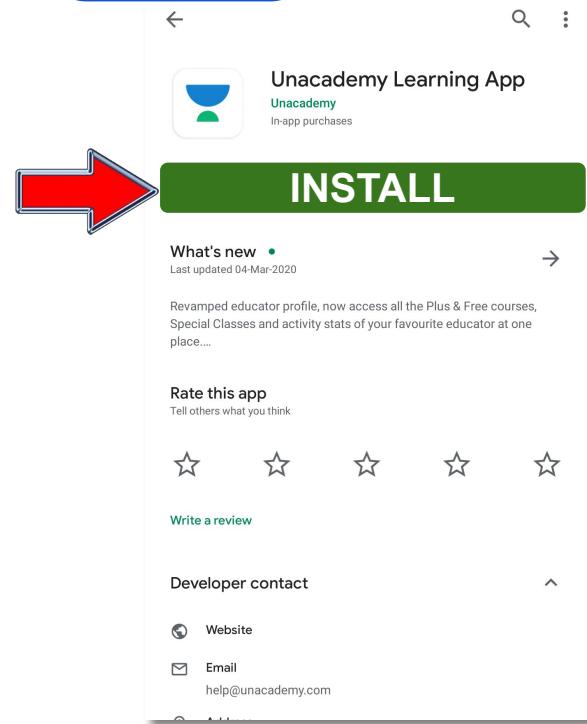


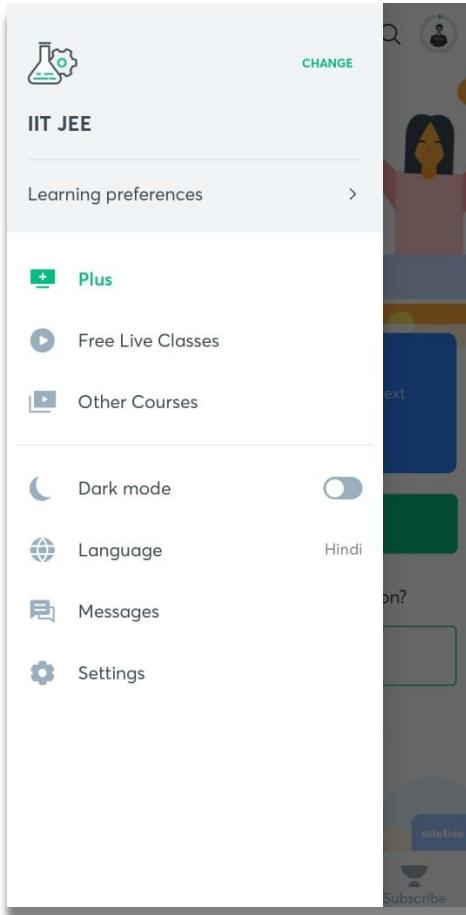
MIHIR PRAJAPATI  
98.16

## Step 1



## Step 2





X

## IIT JEE subscription

PLUS    ICONIC \*

- India's Best Educators
- Interactive Live Classes
- Structured Courses & PDFs
- Live Tests & Quizzes
- Personal Coach
- Study Planner

24 months                    ₹2,100/mo >  
No cost EMI                 +10% OFF ₹50,400

18 months                    ₹2,363/mo >  
No cost EMI                 +10% OFF ₹42,525

12 months                    ₹2,888/mo >  
No cost EMI                 +10% OFF ₹34,650

6 months                    ₹4,200/mo >  
No cost EMI                 +10% OFF ₹25,200

3 months                    ₹5,250/mo >  
+10% OFF ₹15,750

1 month                    ₹6,200/mo >

11<sup>th</sup> / 9, 1012<sup>th</sup> / Drop

SAMEERLIVE



X

## IIT JEE subscription

PLUS    ICONIC \*

 India's Best Educators Interactive Live Classes Structured Courses & PDFs Live Tests & Quizzes Personal Coach Study Planner

24 months

₹3,750/mo

No cost EMI

11<sup>th</sup> / 9, 10

18 months

₹4,000/mo

No cost EMI



12 months

₹4,875/mo

No cost EMI

12<sup>th</sup> / Drop

6 months

₹5,700/mo

No cost EMI



To be paid as a one-time payment



SAMEERLIVE



# IIT JEE BUMPER OFFER





unacademy



jee **LIVE** daily

**Test Series 2022**

**Test Series 2023**

**9th & 23rd June | 9 AM to 12 PM**





# EMERGE 3.0 BATCH

## JEE Main & Advanced 2023

Started on 12th May



# Upcoming Batches in June



**All Stars Batch : JEE Main 2021**

Started on **9th June 2021**

**Emerge Batch (Class 11th) : JEE Main & Advanced 2023**

Starts on **16th June 2021**

**Early Excel Batch for Droppers : JEE Main & Advanced 2022**

Starts on **16th June 2021**

**Evolve Batch (Class 12th) : JEE Main & Advanced 2022**

Starts on **16th June 2021**





UNACADEMY  
COMBAT  
COMPETE. CRACK. CONQUER.

# UNACADEMY COMBAT SCHOLARSHIP TEST

For IIT-JEE Aspirants

Rank 1 - 3



1 year IIT-JEE Plus  
Subscription

Rank 4 - 10



75% Scholarship

Rank 11 - 50



50% Scholarship

Rank 51 - 150



25% Scholarship

## Enroll for Free

Win Scholarship\* from a pool of

# ₹ 4 Crore

Terms and conditions apply\*

Take it live from android

## Every Sunday - 11 AM

To unlock, use code

# SAMEERLIVE

LUCKY  
PARTICIPANTS  
WILL GET A  
SURPRISE GIFT\*!!



\*TERMS AND CONDITIONS APPLY

# Thank You

+ SUBSCRIBE



@sameer\_iitr



#JEE<sup>Live</sup> Daily



Download Now !