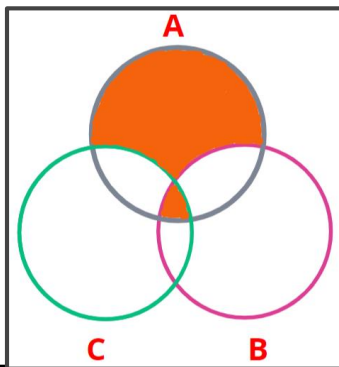




# PYQ

Previous Year Questions

## SETS



**Sameer Chincholikar**

**Sameer Chincholikar**  
**B.Tech, M.Tech - IIT-Roorkee**

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

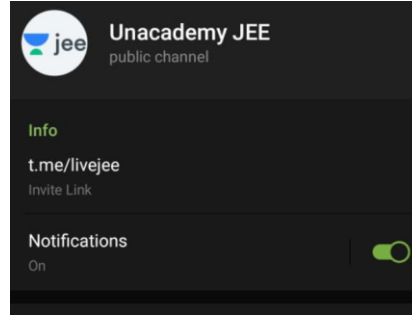
 sameer\_iitr

 **#JEELiveDaily**





## Telegram Channel



IIT JEE

Search



### Sameer Chincholikar ✓

#3 Educator in Mathematics · IIT JEE

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

Follow

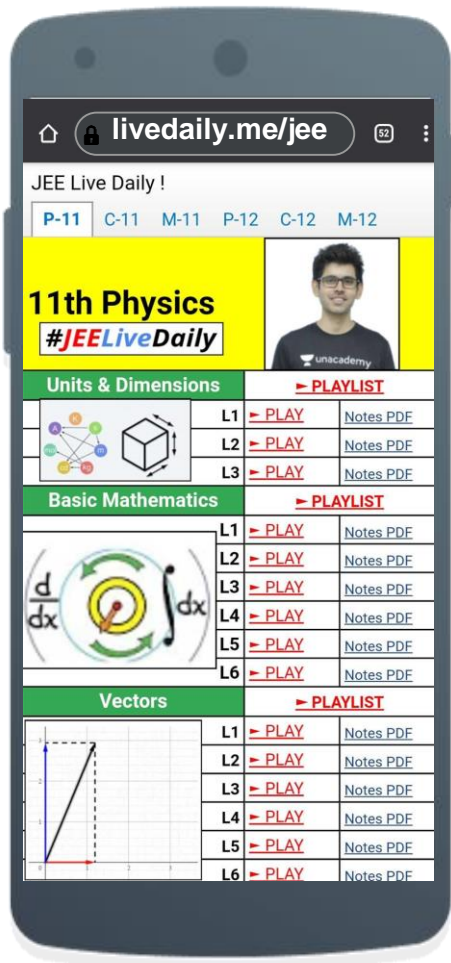
47M Watch mins

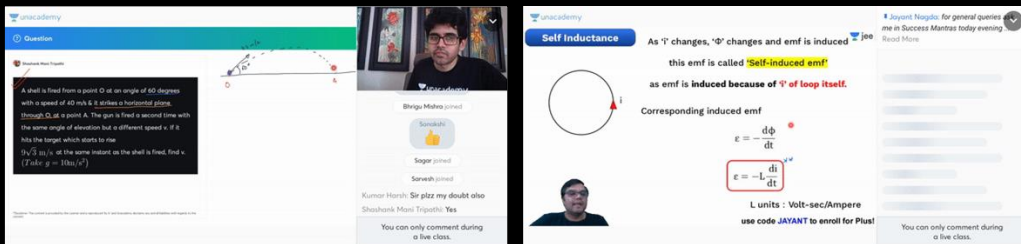
1M Watch mins (last 30 days)

75K Followers

9K Dedications



[livedaily.me/jee](https://livedaily.me/jee)




**Question:** A shell is fired from a point O at an angle of 60 degrees with a speed of 40 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 hits the target which starts to rise  $(\sqrt{3}/2) \text{ m/s}^2$  at the same instant as the shell is fired, find  $v$ . (Take  $g = 10 \text{ m/s}^2$ )

**Self Inductance:** As  $\Phi$  changes,  $\mathcal{E}$  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

$$\mathcal{E} = -\frac{d\Phi}{dt}$$

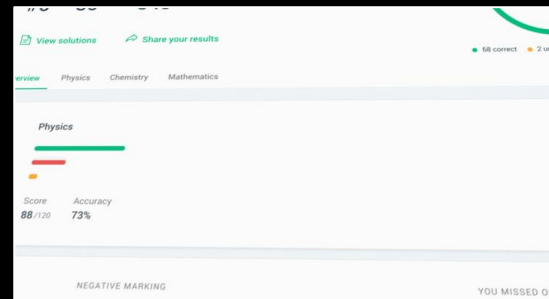
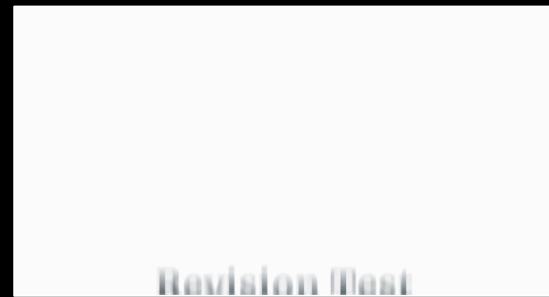
$$\mathcal{E} = -L \frac{di}{dt}$$

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**

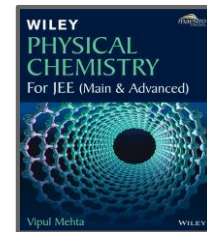
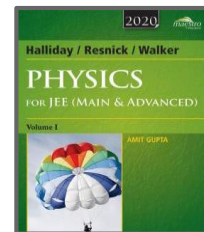
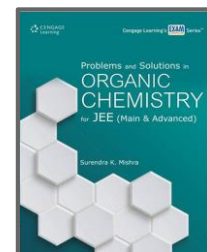
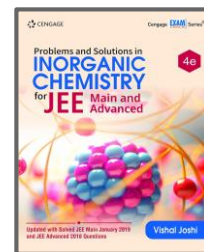
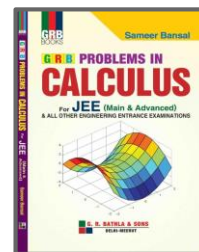
HINDI PHYSICS

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



## 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



SAMEERLIVE

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

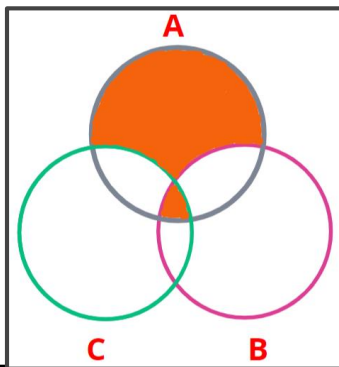




# PYQ

Previous Year Questions

## SETS



**Sameer Chincholikar**

# LET'S BEGIN!!

Set A has  $m$  elements and set B has  $n$  elements. If the total number of subsets of A is 112 more than the total number of subsets of B, then the value of  $m.n$  is 28

[Sep. 06, 2020 (1)]

$$\begin{aligned} 2^m - 2^n &= 112 \\ 2^n(2^{m-n} - 1) &= 4 \times 28 \\ n=4 \quad \left| \begin{array}{l} m-n=3 \\ m=7 \end{array} \right. &= 4 \times 4 \times 7 \\ &= 2^4(2^3 - 1) \end{aligned}$$



Let  $S = \{1, 2, 3, \dots, 100\}$ . The number of non-empty subsets  $A$  of  $S$  such that the product of elements in  $A$  is even is :

A.  $2^{100} - 1$

☒ B.  $2^{50}(2^{50} - 1)$

C.  $2^{50} - 1$

D.  $2^{50} + 1$

[Jan. 12, 2019 (1)]

$$\text{Total (non empty)} = (2^{100} - 1)$$

$$S' = \{1, 3, 5, \dots, 99\}$$

$$(\text{only odd values}) = (2^{50} - 1)$$

Ans:  $(2^{100} - 1) - (2^{50} - 1)$


$$2^{100} - 2^{50}$$

$$2^{50} (2^{50} - 1)$$

$\{1, \cancel{2}, 3, \cancel{4}, 5\}$

$\{1, 2\}$





A survey shows that 73% of the persons working in an office like coffee, whereas 65% like tea. If  $x$  denotes the percentage of them, who like both coffee and tea, then  $x$  cannot be :

A. 63

☒ B. 36

C. 54

D. 38

[Sep. 05, 2020 (1)]

$$n(C) = 73\%$$

$$n(T) = 65\%$$

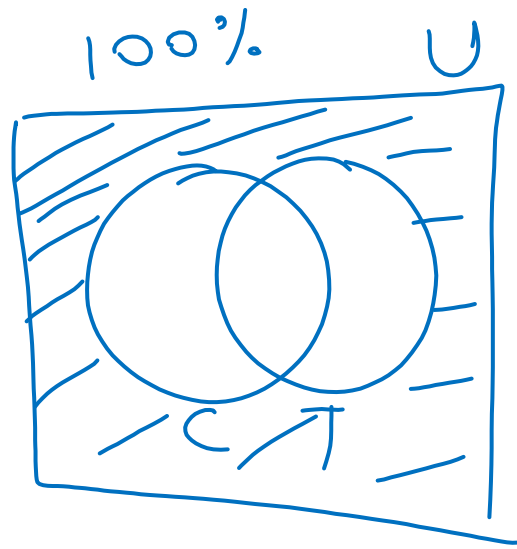
$$n(C \cap T) = x\%$$


$$n(C \cup T) \leq 100$$

$$73 + 65 - x \leq 100$$

$$138 - 100 \leq x$$

$$\boxed{x \geq 38}$$





A survey shows that 63% of the people in a city read newspaper A whereas 76% read newspaper B. If  $x\%$  of the people read both the newspapers, then a possible value of  $x$  can be :

~~A.~~ 29

~~B.~~ 37

~~C.~~ 65

☒ D. 55

Sep. 04, 2020 (1)]

$$n(A) = 63\%$$

$$n(B) = 76\%$$

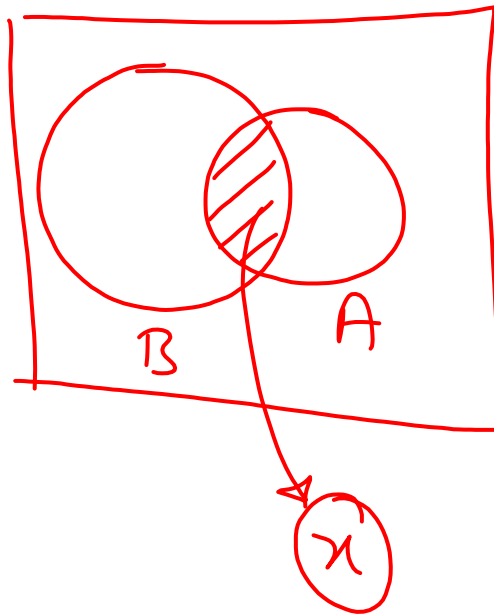
$$n(A \cap B) = x\%$$

$$n(A \cup B) \leq 100$$

$$63 + 76 - x \leq 100$$

$$139 - 100 \leq x$$

$$\boxed{x \geq 39}$$



$$\chi \leq 63\%$$



Let  $\bigcup_{i=1}^{50} X_i = \bigcup_{i=1}^n Y_i = T$ , where each  $X_i$  contains 10 elements and each  $Y_i$  contains 5 elements.

If each element of the set  $T$  is an element of exactly

20 of sets  $X_i$ 's and exactly 6 of sets  $Y_i$ 's, then  $n$  is equal to

Sep. 04, 2020 (2)]

10 elements  
each

A. 15

B. 50

C. 45

✓ D. 30

$$X_1 \cup X_2 \cup X_3 \cup \dots \cup X_{50} = T$$

(5 elements each)

$$Y_1 \cup Y_2 \cup Y_3 \cup \dots \cup Y_n = T$$

$$n(T) = x$$


$$20 \times x = 10 \times 50$$

$$x = 25$$

$$25 \times 6 = 5n$$







Let  $X = \{n \in \mathbb{N} : 1 \leq n \leq 50\}$ . If  
 $A = \{n \in X : n \text{ is a multiple of } 2\}$  and  
 $B = \{n \in X : n \text{ is a multiple of } 7\}$ , then the number of  
elements in the smallest subset of  $X$  containing both  $A$  and  $B$  is\_\_\_\_\_

[Jan. 7, 2020 (2)]

$$X = \{1, 2, 3, \dots, 50\}$$

$$A = \{2, 4, 6, \dots, 50\}$$

$$B = \{7, 14, 21, \dots, 49\}$$

$$\{14, 28, 42\}$$

$$n(A) = 25$$


$$n(B) = 7$$

$$n(A \cap B) = 3$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$= 25 + 7 - 3$$

$$= \textcircled{29}$$



In a class of 140 students numbered 1 to 140, all even numbered students opted Mathematics course, those whose number is divisible by 3 opted Physics course and those whose number is divisible by 5 opted Chemistry course. Then the number of students who did not opt for any of the three courses is:

[Jan. 10, 2019 (2)]

A. 102

B. 42

C. 1

✓ D. 38

$$n(M) \Rightarrow 2N : 70$$

$$n(P) \Rightarrow 3N : 46$$

$$n(C) \Rightarrow 5N : 28$$

$$n(M \cap P) \Rightarrow 6N : 23$$

$$n(P \cap C) \Rightarrow 15N : 9$$

$$n(C \cap M) \Rightarrow 10N : 14$$

$$n(M \cap P \cap C) \Rightarrow 30N : 4$$

$$\begin{aligned}
 n(M \cup P \cup C) &= n(M) + n(P) + n(C) \\
 &\quad - n(M \cap P) - n(P \cap C) - n(C \cap M) \\
 &\quad + n(M \cap P \cap C)
 \end{aligned}$$

$$\begin{aligned}
 &= (70 + 46 + 28) \\
 &\quad - (23 + 9 + 14) + 4 \\
 &= 144 - 46 + 4 = \boxed{102}
 \end{aligned}$$

Let A, B and C be sets such that  $\Phi \neq A \cap B \subseteq C$ , Then which of the following statements is not true?

A.  $B \cap C \neq \Phi$  ✓

B. If  $(A - B) \subseteq C$ , then  $A \subseteq C$  ✓

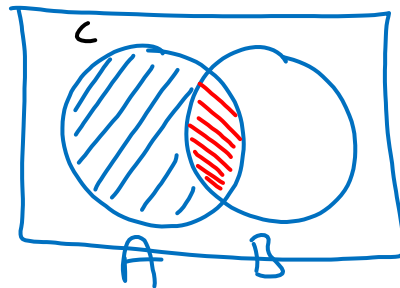
[April. 12, 2019 (2)]

C.  $(\underline{C \cup A}) \cap (\underline{C \cup B}) = C$  ✓

✓ D. If  $(A - C) \subseteq B$  then  $A \subseteq B$

$$\begin{cases} A \cap B \neq \emptyset \\ A \cap B \subseteq C \end{cases}$$

$$\begin{aligned} & \{ x \in A \} \\ & \rightarrow \{ x \in B \} \\ & \quad x \in A \cap B \\ & \rightarrow x \in C \end{aligned}$$



$$C \cup (A \cap B) = C \quad \checkmark$$





Two newspapers A and B are published in a city. It is known that 25% of the city population reads A and 20% reads B while 8% reads both A and B. Further, 30% of those who read A but not B look into advertisements and 40% of those who read B but not A also look into advertisements, while 50% of those who read both A and B look into advertisements. Then the percentage of the population who look into advertisements is:

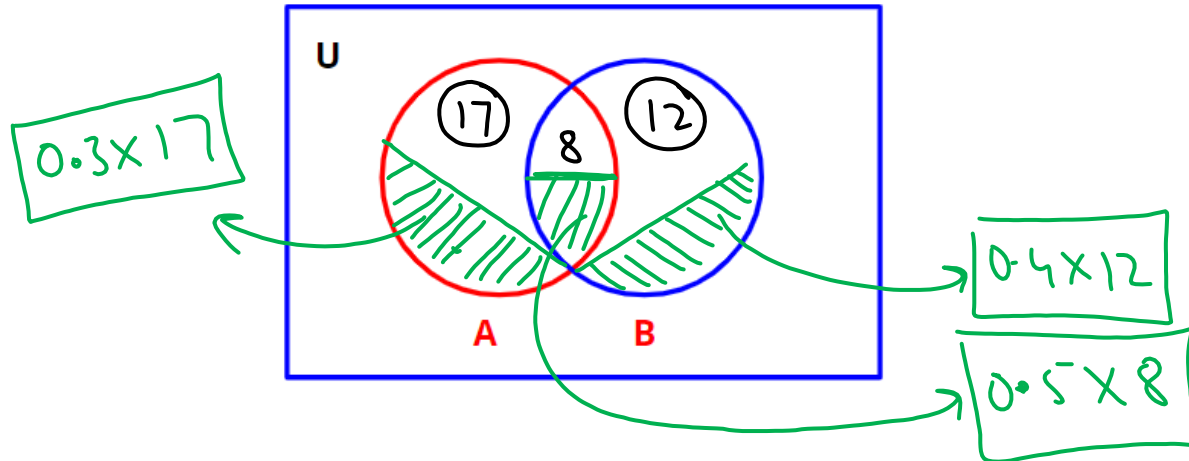
✓ A. 13.9

B. 12.8

C. 13

D. 13.5

[April. 09, 2019 (2)]



$$\begin{array}{r}
 5.1 \\
 4.8 \\
 4.0 \\
 \hline
 13.9
 \end{array}$$





# Daily | TIMETABLE

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

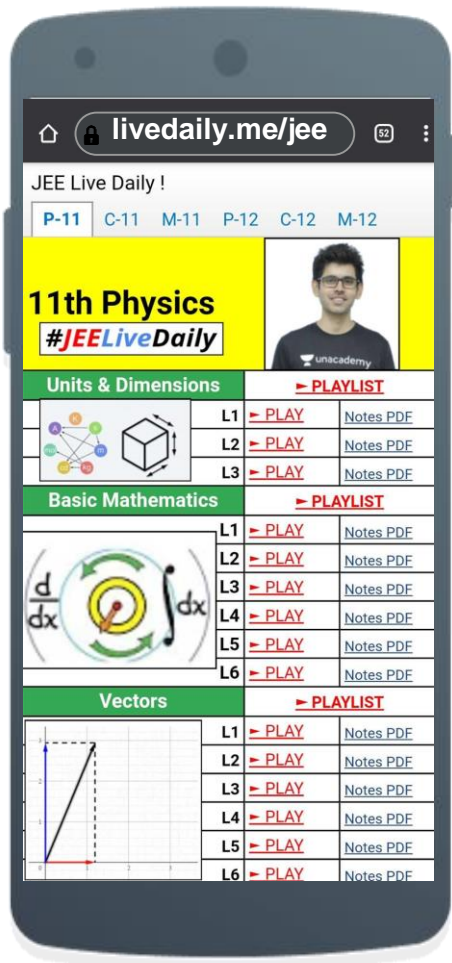
3:00 - 4:30 PM

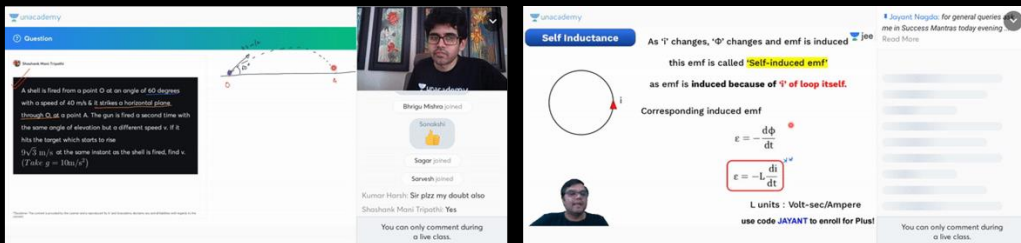


Nishant Sir | Maths

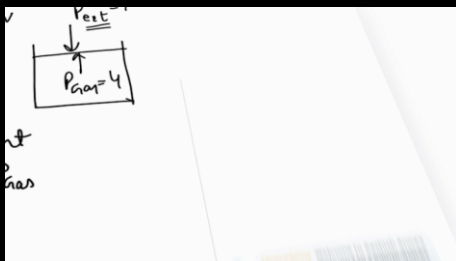
4:30 - 6:00 PM

[livedaily.me/jee](https://livedaily.me/jee)



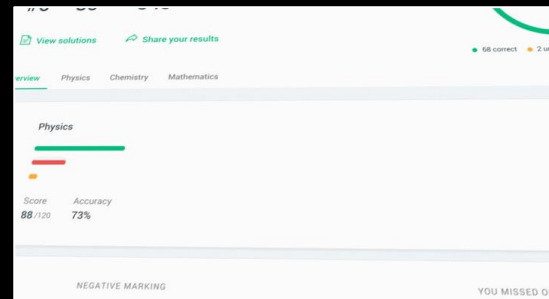
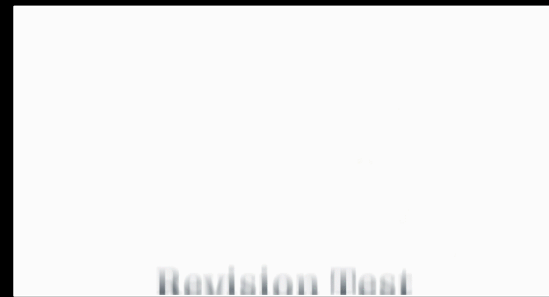


The screenshot shows a live class interface with two panels. The left panel displays a physics problem: "A shell is fired from a point O at an angle of 60 degrees with a speed of 40 m/s. It strikes a horizontal plane through O at a point A. The gun is fired a second time with the same angle of elevation but a different speed  $v$ . If it hits the target which starts to rise  $(\sqrt{3}/2) \text{ m/s}^2$  at the same instant as the shell is fired, find  $v$ . (Take  $g = 10 \text{ m/s}^2$ )". The right panel shows a lecture on "Self Inductance" with text: "As  $\Phi$  changes,  $\frac{d\Phi}{dt}$  changes and emf is induced. This emf is called **Self-induced emf** as emf is induced because of  $\Phi$  of loop itself." It also includes the formula for induced emf:  $\mathcal{E} = -L \frac{di}{dt}$  and units: Volt-sec/Ampere.



## + LIVE Class Environment

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



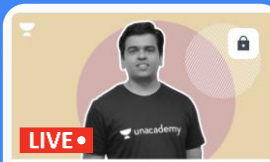
## + Performance Analysis

- + 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**

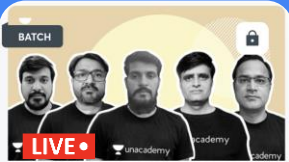
**LIVE**

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**

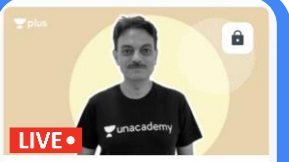
**LIVE**

HINDI

Final Rapid Revision Batch for JEE Main 2021

Starts on Apr 6

Manoj Chauhan and 2 more



**plus**

**LIVE**

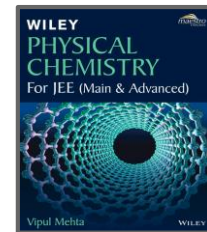
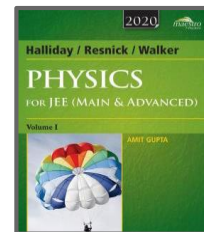
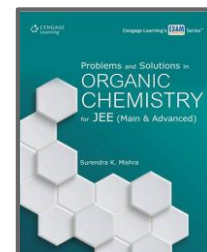
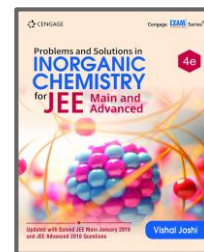
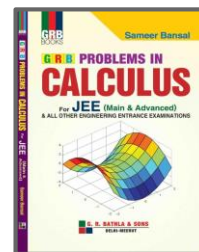
HINDI PHYSICS

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



Vaishnovi 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

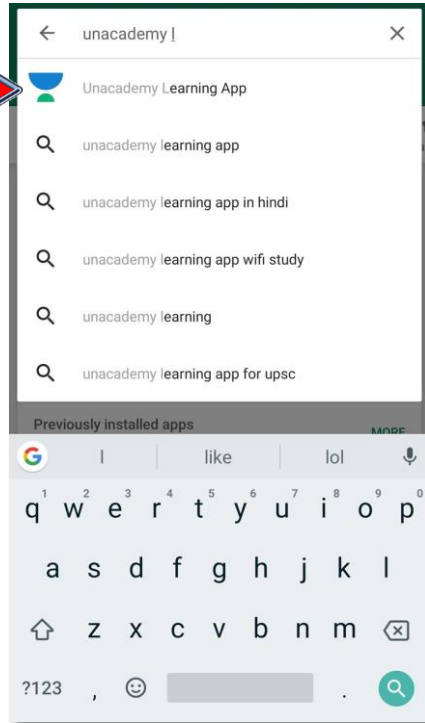


Naman Goyal  
98.48

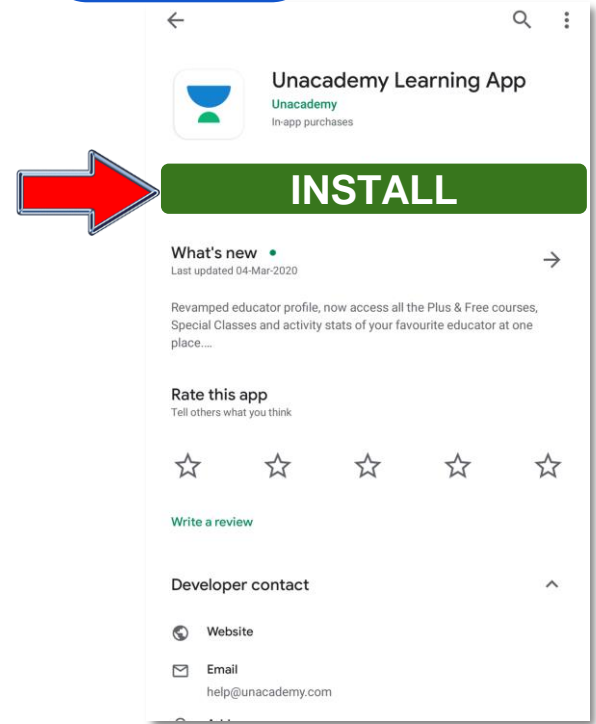


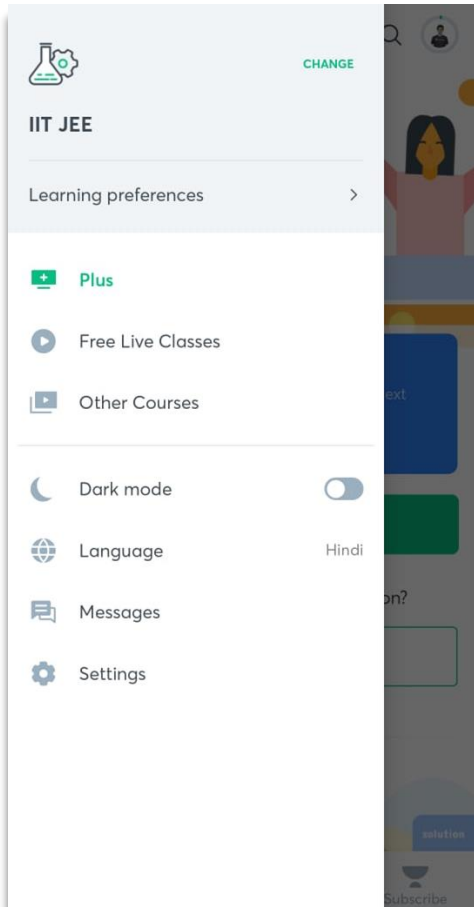
MIHIR PRAJAPATI  
98.16

## Step 1



## Step 2





× 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 >

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

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

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

12<sup>th</sup> / Drop

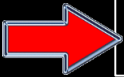
6 months ₹4,200/mo  
No cost EMI +10% OFF ₹25,200 >

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

1 month ₹6,200/mo  
+10% OFF ₹11,820 >



SAMEERLIVE







# EVOLVE 3.0 BATCH

**JEE Main & Advanced 2022**  
**Started on 7th April**





**India's Biggest Test Series**

# **USAT**

**(Unacademy Scholarship Assessment Test)**

**Every Sunday At 12 PM - 3 PM**

**Enroll Now for Free**

**Scholarship Worth Rs 1 Crore\***

# Thank You



@sameer\_iitr



#JEELiveDaily



+ SUBSCRIBE



PDF



Download Now !

