

Operating System: Multilevel Paging

By: Vishvadeep Gothi



VISHVADEEP GOTHI SIR

**AIR- 19, 119, 440, 682
in GATE**



**ME from IISc Bangalore
Mtech BITS Pilani in Data
Science**



**14+ Years of Teaching Experience,
10+ Years in GATE/IES**



Subjects Taken:
Computer Organization & Architecture,
data structure, operating system,
C-Programming, Data science,
Machine Learning, Python,
coding interview problems,



Special

VDEEP10



Vishvadeep Gothi

#1 Educator in CS & IT · GATE & ESE

- GATE AIR-19, 119, 440, 682 - ME from IISc, - MTech BITS Pilani (Data Science) - 14 years experience

Follow Me on  unacademy

http://www.unacademy.com/@vd_gothi

<http://tiny.cc/VDEEP10>



Study Planner

Customized study plan and track your performance.

doubt



Study Booster Sessions

Receive Essential Guidelines via Regular workshops



Personal Coach

One on one guidance on preparation strategy.



Live Classes



Crash Courses



Personalised Test Analysis

Get in-depth analysis of tests by section & question type.



ICONIC



PLUS

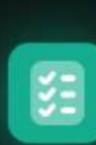
dpp



RIB



Weekly Tests



English & Hindi



Preparatory Study Material

Specialised notes & practice sets.

GATE & ESE

PLUS **ICONIC**

6 MONTHS <small>SAVE 25%</small> ₹3,713/mo	12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTH <small>SAVE 61%</small> ₹1,925/mo
--	---	--

No cost EMI available on 6 months ... >

VDEEP10

₹27,225
for 12 months

Proceed to payment

GATE & ESE

PLUS **ICONIC**

<small>Most Popular</small>	12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTHS <small>SAVE 61%</small> ₹1,925/mo	24 MONTH <small>SAVE 67%</small> ₹1,650/mo
-----------------------------	---	---	--

No cost EMI available on 6 months ... >

VDEEP10

₹34,650
for 18 months

Proceed to payment

GATE & ESE

PLUS **ICONIC**

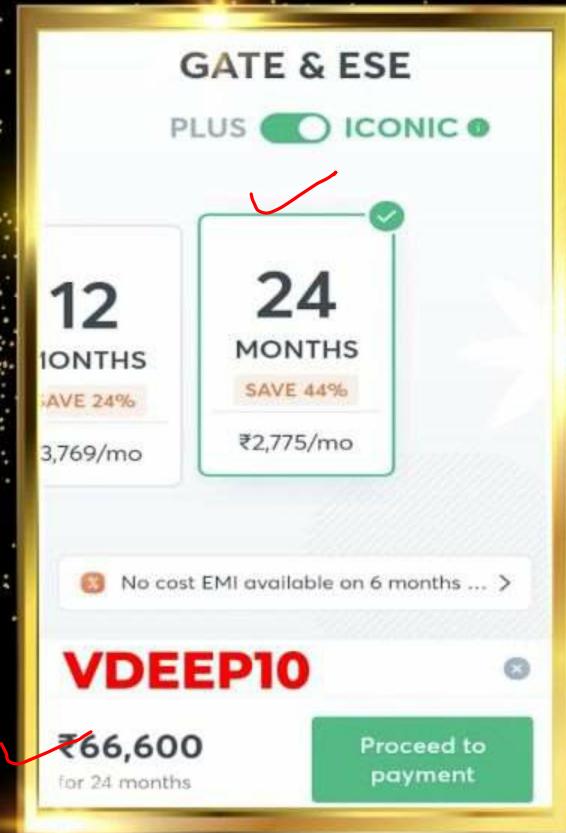
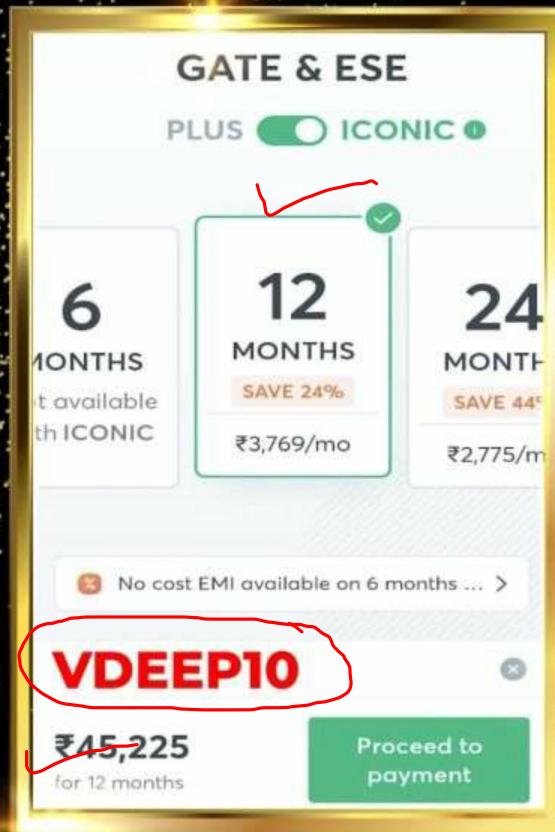
18 MONTHS <small>SAVE 61%</small> ₹1,925/mo	24 MONTHS <small>SAVE 67%</small> ₹1,650/mo
---	---

No cost EMI available on 6 months ... >

VDEEP10

₹39,600
for 24 months

Proceed to payment





Use Code:
VDEEP10

PRICE HIKE UPCOMING GATE & ESE - PLUS SUBSCRIPTION

Subscription Duration	Current Price	NEW PRICE +7.25%
3 Month	₹ 13,750	₹ 14,750
6 Month	₹ 24,750	₹ 26,650
12 Month	₹ 30,250	₹ 32,450
18 Month	₹ 38,500	₹ 41,300
24 Month	₹ 44,000	₹ 47,200

Last Date to Avail these prices : **21st July 2021**

Beat it and

SUBSCRIBE NOW

Use Code:
VDEEP10

COMBO OFFER

GATE & ESE + CAMPUS PLACEMENT-IT JOBS

It's time to widen your horizon - Prepare for Campus Placement and GATE & ESE with one subscription !



GATE & ESE

- CHEMICAL
- MECHANICAL
- CS & IT
- CIVIL
- ELECTRICAL
- ECE



CAMPUS PLACEMENT - IT JOBS

- VERBAL ABILITY
- REASONING ABILITY
- NUMERICAL ABILITY
- CODING SKILLS
- PROGRAMMING LOGIC

TOTAL VALUE OFFERING
₹43,250

OFFER PRICE
₹35,033



Use Code:
VDEEP10

NEW
BATCH
ALERT

BATCH - V

EVOLVE FOR GATE 2022

COMPUTER SCIENCE & IT



RAVINDRABABU
RAVULA



+ SUBBA RAO



SANCHIT JAIN



VENKAT RAO



VISHVADEEP
GOTHI



SWETA KUMARI

WE START WITH

ALGORITHMS
by Subba Rao

06:00 PM

FOR 10% DISCOUNT

USE CODE

START DATE

**14
JULY
2021**

Are You Ready??

USE CODE

VDEEP10TO GET
MAX DISCOUNT ON

Assume

$$\text{no. of pages} = \frac{16 \text{ MB}}{1 \text{ KB}} = 16K$$

Process Size = 16MB

Page size = 1KB

Page table entry size = 4Bytes

Page Table Size = ? no. of pages * entry size

$$16K * 4B$$

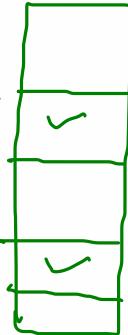
$$= 64KB$$

→ P.T. size > Page size → P.T. should be stored on multiple pages.

Now What?

Can you keep entire page table in single page?

If not then how to access the specific entry?



Let's Take a Simple Example

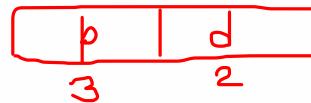
Process Size = 32B

Page size = 4B

Page table entry size = 1B

$$\text{no. of pages} = \frac{32B}{4B} = 8$$

L.A. = 5-bits

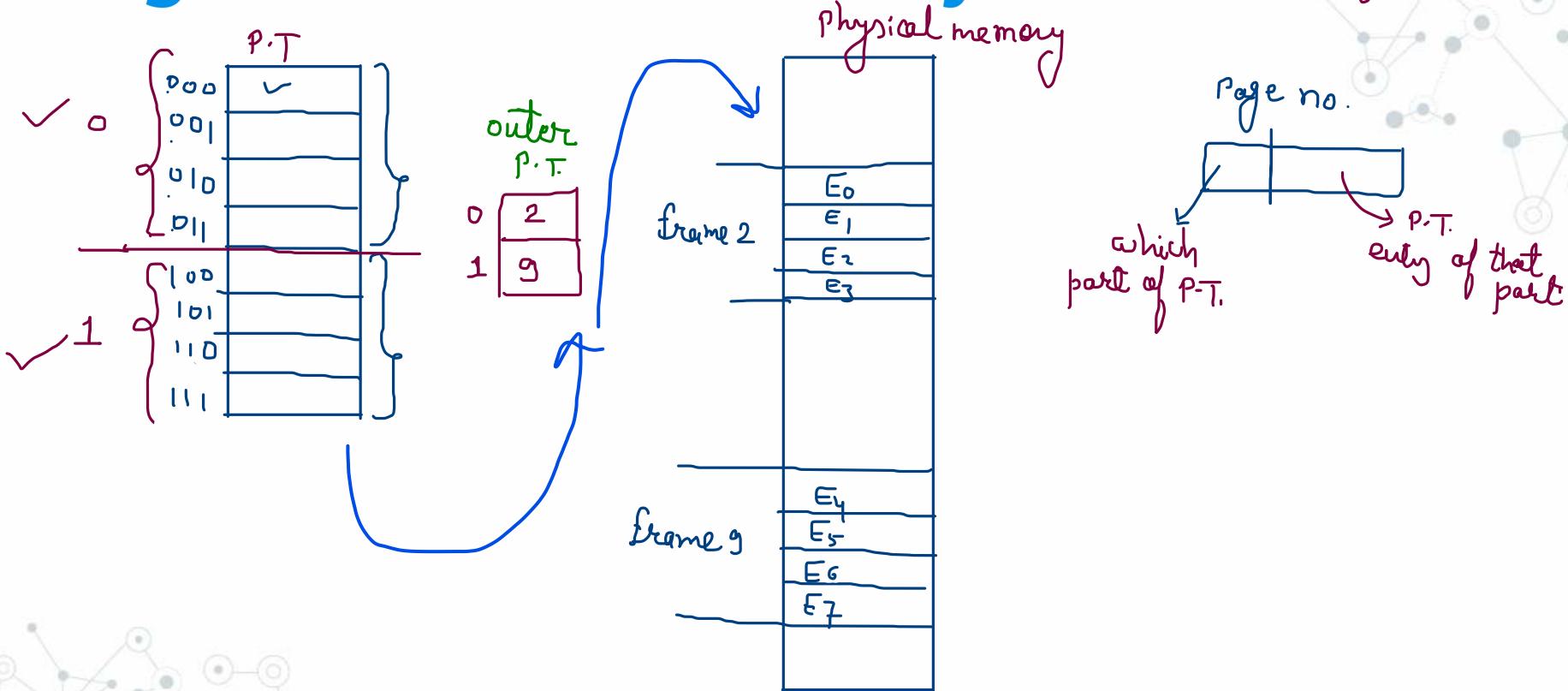


$$\begin{aligned}\text{Page Table Size} &= ? = 8 * 1B \\ &= 8B\end{aligned}$$

$$\begin{aligned}\text{no. of pages required for P.T.} &= \frac{8B}{4B} \\ &= 2 \text{ pages}\end{aligned}$$

Page Table in Memory

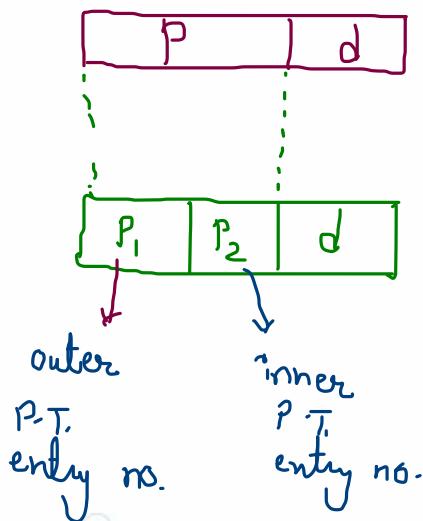
no. of P.T. entries in one page = $\frac{4B}{1B} = 4$



Multilevel Paging

↳ when entire P.T. can not be stored on single frame.

L.A.



Multilevel Paging

Ans) No. of pages = 2^{15}

Page size = $2KB$

P.T. entry = $4B$

P.T. size = $2^{15} * 4B$

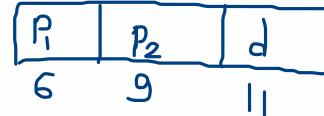
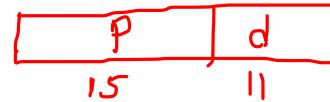
$$= 2^7 B$$

$$= 128 KB$$

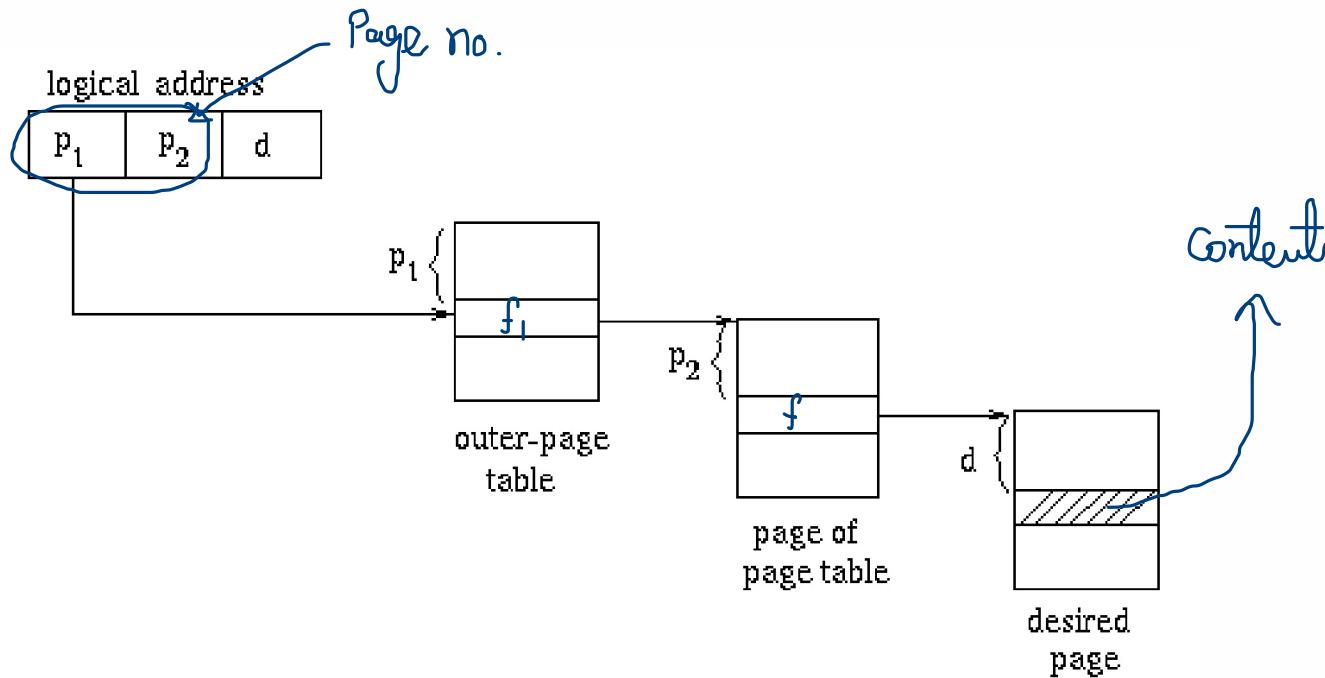
no. of P.T. entries in one page = $\frac{2KB}{4B}$
= 2^9

no. of pages for P.T. = $\frac{128KB}{2KB} = 64$

L.A.



Multilevel Paging



Multilevel Paging

Ques)

$$\text{No. of pages} = 2^{20}$$

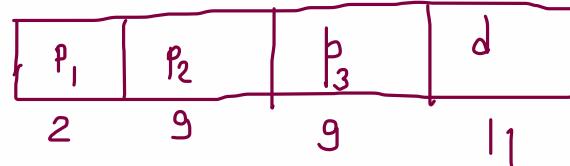
$$\text{Page size} = 2\text{KB}$$

$$\text{entry size} = 4\text{B}$$

$$\text{no. of entries in one page} = \frac{2\text{KB}}{4\text{B}}$$

$$= 2^9$$

L.A.



Next Class

Multilevel Paging



Segments



Questions on Multilevel Paging



NEW INITIATIVE: FAQS OF GATE ASPIRANTS

SESSIONS ON:

LIST OF REFERENCE BOOKS

LIST OF IMPORTANT TOPICS

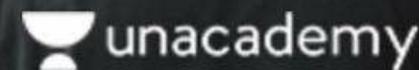
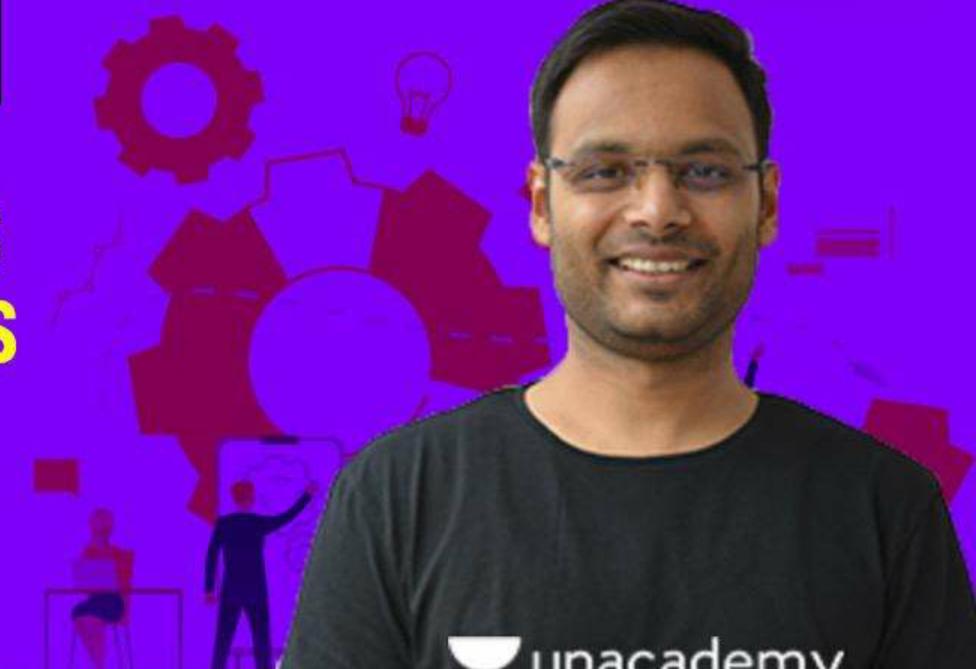
REVISION STRATEGY

HOW TO MAKE NOTES

STARTING FROM: 12 JULY

VISHVADEEP GOTHI SIR

TIME:
9:00AM
(MON-FRI)





PRICE HIKE UPCOMING

GATE & ESE - PLUS SUBSCRIPTION

Use Code:
VDEEP10

22nd

July

Subscription Duration	Current Price	NEW PRICE +7.25%
3 Month	₹ 13,750	₹ 14,750
6 Month	₹ 24,750	₹ 26,650
12 Month	₹ 30,250	₹ 32,450
18 Month	₹ 38,500	₹ 41,300
24 Month	₹ 44,000	₹ 47,200

Last Date to Avail these prices : 21st July 2021

Beat it and

SUBSCRIBE NOW



COMBO OFFER

GATE & ESE + CAMPUS PLACEMENT-IT JOBS

It's time to widen your horizon - Prepare for Campus Placement and GATE & ESE with one subscription !



GATE & ESE



CAMPUS PLACEMENT - IT JOBS

CHEMICAL

MECHANICAL

CS & IT

CIVIL

ELECTRICAL

ECE



VERBAL ABILITY

REASONING
ABILITY

NUMERICAL
ABILITY

CODING SKILLS

PROGRAMMING
LOGIC

TOTAL VALUE OFFERING

₹43,250

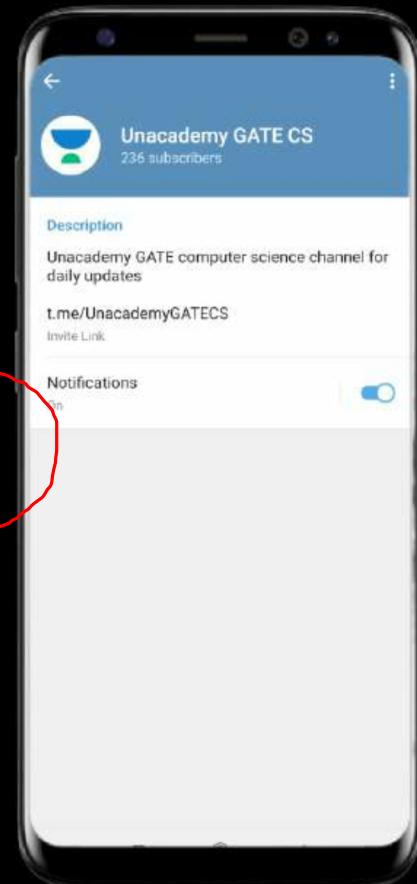
OFFER PRICE

₹35,033

Use Code:
VDEEP10



<https://t.me/UnacademyGATECS>





Use Code:
VDEEP10

NEW
BATCH
ALERT

BATCH - V

EVOLVE FOR GATE 2022

COMPUTER SCIENCE & IT



RAVINDRABABU
RAVULA



+ SUBBA RAO



SANCHIT JAIN



VENKAT RAO



VISHVADEEP
GOTHI



SWETA KUMARI

START DATE

**14
JULY
2021**



WE START WITH

ALGORITHMS
by Subba Rao

06:00 PM

FOR 10% DISCOUNT

USE CODE



Use Code:
VDEEP10

We have heard you!

**Due to high demand by
the learners, we
have extended
the date of the
Price Hike!**

SUBSCRIBE NOW



ICONIC

+ **PLUS**



**Preparatory Study
Material**

Specialised notes & practice sets.



RIB

English & Hindi



Doubt Solving



Weekly Tests



Crash Courses



Live Classes



Personal Coach

One on one guidance on preparation strategy.



Study Planner

Customized study plan and track your performance.



Study Booster Sessions

Receive Essential Guidelines via Regular workshops



Personalised Test Analysis

Get in-depth analysis of tests by section & question type.

GATE & ESE

PLUS **ICONIC**

6 MONTHS <small>SAVE 25%</small> ₹3,713/mo	12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTH <small>SAVE 61%</small> ₹1,925/mo
--	---	--

No cost EMI available on 6 months ... >

VDEEP10

₹27,225
for 12 months

Proceed to payment

GATE & ESE

PLUS **ICONIC**

6 MONTHS <small>SAVE 25%</small> ₹3,713/mo	12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTHS <small>SAVE 61%</small> ₹1,925/mo
12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTHS <small>SAVE 61%</small> ₹1,925/mo	24 MONTH <small>SAVE 67%</small> ₹1,650/mo

No cost EMI available on 6 months ... >

VDEEP10

₹34,650
for 18 months

Proceed to payment

GATE & ESE

PLUS **ICONIC**

6 MONTHS <small>SAVE 25%</small> ₹3,713/mo	12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTHS <small>SAVE 61%</small> ₹1,925/mo
12 MONTHS <small>SAVE 54%</small> ₹2,269/mo	18 MONTHS <small>SAVE 61%</small> ₹1,925/mo	24 MONTHS <small>SAVE 67%</small> ₹1,650/mo

No cost EMI available on 6 months ... >

VDEEP10

₹39,600
for 24 months

Proceed to payment

GATE & ESE

PLUS  ICONIC

6
MONTHS

Not available
with ICONIC

12
MONTHS

SAVE 24%
₹3,769/mo

24
MONTHS

SAVE 44%
₹2,775/mo

 No cost EMI available on 6 months ... >

VDEEP10

₹45,225

for 12 months

Proceed to
payment

GATE & ESE

PLUS  ICONIC

12
MONTHS

SAVE 24%
₹3,769/mo

24
MONTHS

SAVE 44%
₹2,775/mo

 No cost EMI available on 6 months ... >

VDEEP10

₹66,600

for 24 months

Proceed to
payment



UNACADEMY COMBAT



India's Largest **Weekly Competition** for GATE



Take it **Live** to compete with the best



Access your GATE preparation in **60 minutes**



Super fast and fun with **All India Live Leaderboard**



Challenging & **Original GATE Questions** curated by the Best Educators



Identify & improve your weak areas through **detailed video solutions**



USE CODE

VDEEP10

July 18, 25 | Starts at 11 AM



UNACADEMY
COMBAT



Unacademy
Subscription



Unacademy
Subscription



Unacademy
Subscription



Unacademy
Subscription

RANK 1-3

Complimentary
Unacademy Plus
subscription for One Year

RANK 4-10

75% off on Unacademy
Plus subscription for the
tenure of your choice.

RANK 11-50

50% off on Unacademy
Plus subscription for the
tenure of your choice.

RANK 51-100

25% off on Unacademy
Plus subscription for the
tenure of your choice.

*Winners can choose from 6 months / 12 months / 18
months / 24 months GATE & ESE Plus subscription.

Terms & Conditions Apply



BUGS BOUNTY



Opportunity for all Learners to report any inappropriate content in the video

Be the first one to report a particular issue to claim your prize

Report any inappropriate content using the form in the description



India's No. 1 Study Channels

Kreatryx GATE
EE,ECE,IN



Unacademy GATE
ME,PI,XE



Unacademy
GATE CE



Unacademy
GATE Telugu



Unacademy
SSC JE



Unacademy
Computer Science



Unacademy GATE
Questions



Electrical
Junction



Engineering
Pathshala



GS Terminal -
RRB, SSC





✓ Happy Learning

Thank You

