

# Operating System:

## GATE PYQ – Virtual Memory

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,**

**VDEEP10**

Get **10% Off**  
on Unacademy  
**Plus Subscription**



# 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

*Special*

**VDEEP10**

Follow Me on  unacademy

[http://www.unacademy.com/@vd\\_gothi](http://www.unacademy.com/@vd_gothi)

<http://tiny.cc/VDEEP10>

# Upcoming Special Class

ENGLISH CS & IT

## Operating System Practice Questions

Starts on Aug 11, 2021 • 3:00 PM

In this session Vishvadeep Gothi will provide practice questions to students on subject operating system. And will solve those questions to make students learn how to solve questions.



**11 Aug 2021** ✓

**3:00PM – 5:30PM** ✓





# SPECIAL CLASS FEATURES



## INTERACTIVE LIVE CLASSES

Attend Live classes,  
Participate in  
Live chat and Get  
your doubts cleared



## POLLS FOR THE LEARNERS

Respond to  
Polls for a Better  
Understanding  
of a Topic



## NEVER MISS A CLASS

Get notified for  
Upcoming  
Classes and  
Recommendations  
Curated Just for you



## LECTURE NOTES

Download Lecture  
Notes & Get Access  
to Recorded Session  
of Live Classes



## ANYTIME ANYWHERE

Watch our Classes,  
Live or Recorded,  
Anytime from  
Any of Your Devices.



### Study Planner

Customized study plan and track your performance.



### Study Booster Sessions

Receive Essential Guidelines via Regular workshops



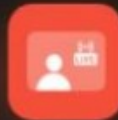
### Personal Coach

One on one guidance on preparation strategy.

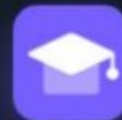


### Personalised Test Analysis

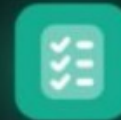
Get in-depth analysis of tests by section & question type.



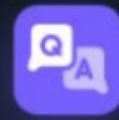
Live Classes



Crash Courses



Weekly Tests



Doubt Solving



RIB



English & Hindi



### Preparatory Study Material

Specialised notes & practice sets.



ICONIC



PLUS


doubt

dpp

## GATE & ESE subscription

PLUS

ICONIC

 No cost EMI available on 6 months & above subscription plans

<input checked="" type="radio"/>	24 months	60% OFF	₹42,480 <small>₹42,200</small>	₹1,770 per month
<input type="radio"/>	18 months	53% OFF	₹37,170 <small>₹41,900</small>	₹2,065 per month
<input type="radio"/>	12 months	45% OFF	₹29,205 <small>₹32,450</small>	₹2,434 per month
<input type="radio"/>	6 months	10% OFF	₹23,985 <small>₹26,650</small>	₹3,998 per month
<input type="radio"/>	3 months		₹13,275 <small>₹14,750</small>	₹4,425 per month

To be paid as a one-time payment



VDEEP10 ×


Aweosomal You get 10% off

Proceed to pay

## GATE & ESE subscription

PLUS

ICONIC

 No cost EMI available on 6 months & above subscription plans

<input checked="" type="radio"/>	24 months	26% OFF	₹66,600 <small>₹74,000</small>	₹2,775 per month
<input type="radio"/>	18 months	14% OFF	₹58,050 <small>₹64,500</small>	₹3,225 per month
<input type="radio"/>	12 months		₹45,225 <small>₹50,250</small>	₹3,769 per month

To be paid as a one-time payment



VDEEP10 ×

Proceed to pay





BATCH - Z

NEW  
BATCH  
ALERT

EVOLVE FOR  
GATE 2022

COMPUTER SCIENCE & IT



SANCHIT JAIN



RAVINDRABABU  
RAVULA



SUBBA RAO



VENKATA RAO



VISHVADEEP  
GOTHI



SWETA  
KUMARI



UMAMAHESHWARA  
RAO

WE START WITH

Discrete Mathematics

Sanchit Jain

7:00 AM

FOR 10% DISCOUNT

USE CODE

VDEEP10

START DATE

11  
AUG  
2021



# Are You Ready??

USE CODE

**VDEEP10**

TO GET  
**MAX DISCOUNT** ON

 **plus**  
Subscription

# GATE 1989

Match the pairs in the following question.

## List - I

- (A) Virtual Memory — P
- (B) Shared memory — S
- (C) Look-ahead buffer — Q
- (D) Look-aside buffer — R

## List - II

- (p) Temporal locality ✓
- (q) Spatial Locality
- (r) Address Translation ✓
- (s) Mutual exclusion

# GATE 1990

→ 2-level paging

$$t_m = 10^{-8} \text{ Sec}$$
$$t_D = 10^{-3} \text{ Sec}$$

In a two-level virtual memory, the memory access time for main memory,  $t_M = 10^{-8}$  sec, and the memory access time for the secondary memory,  $t_D = 10^{-3}$  sec. What must be the hit ratio,  $H$  such that the access efficiency is within 80 percent of its maximum value?

No TLB given  
↓

$$H = \text{mm hit} \\ (\text{no page fault})$$

$$\text{Best value} = 3 * 10^{-8} \text{ sec}$$

$$0.8 * 3 * 10^{-8} = H * 3 * 10^{-8} + \underbrace{(1-H)}_{\text{page fault rate}} * [2 * 10^{-8} + 10^{-3}]$$

99.99%

page fault rate



# GATE 1991

Indicate all the false statements from the statements given below:

- ☒ A. The amount of virtual memory available is limited by the availability of the secondary memory
- ☒ B. Any implementation of a critical section requires the use of an indivisible machine- instruction ,such as test-and-set.
- ☒ C. The use of monitors ensure that no dead-locks will be caused .
- ☒ D. The LRU page-replacement policy may cause thrashing for some type of programs.
- ☒ E. The best fit techniques for memory allocation ensures that memory will never be fragmented.

A. True

E. False

B. False

C. False

D. True

# GATE 1995

In a paged segmented scheme of memory management, the segment table itself must have a page table because

- ☒ A. The segment table is often too large to fit in one page
- ☐ B. Each segment is spread over a number of pages
- ☐ C. Segment tables point to page tables and not to the physical locations of the segment
- ☐ D. The processor's description base register points to a page table

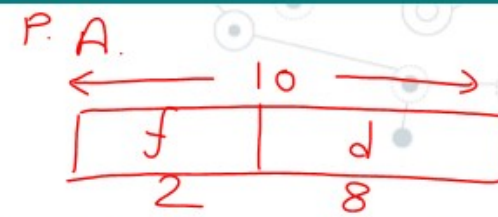
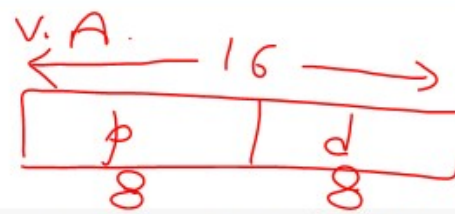
# GATE 1995

In a virtual memory system the address space specified by the address lines of the CPU must be larger than the physical memory size and smaller than the secondary storage size.

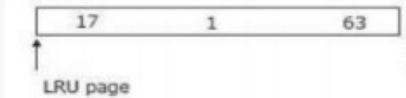
- A. smaller, smaller
- B. smaller, larger
- ☒ C. larger, smaller ✓
- D. larger, larger



# GATE 1996



A demand paged virtual memory system uses 16 bit virtual address, page size of 256 bytes, and has 1 Kbyte of main memory. *LRU* page replacement is implemented using the list, whose current status (page number is decimal) is



For each hexadecimal address in the address sequence given below,

00FF, 010D, 10FF, 11B0

indicate

- the new status of the list
- page faults, if any, and 3
- page replacements, if any.

Page no. ref.  $\Rightarrow 0, 1, 16, 17$

no. of frames = 4

# GATE 1996

17
1
63

0

17
1
63
0

✓

1

16

<del>16</del>
1
63
0

X

✓

17 replaced by 16

17

16
1
17
0

✓

63 replaced by 17

final list

0, 1, 16, 17
--------------

↑  
LRU page

# GATE 1998

avg inst<sup>n</sup> execut<sup>n</sup>  
time =  $i + j * \frac{1}{k}$

If an instruction takes  $i$  microseconds and a page fault takes an additional  $j$  microseconds, the effective instruction time if on the average a page fault occurs every  $k$  instruction is:

- A.  $i + \frac{j}{k}$
- B.  $i + (j \times k)$
- C.  $\frac{i + j}{k}$
- D.  $(i + j) \times k$

for every  $k$  inst<sup>ns</sup>, no. of page faults  
= 1

for  $\frac{1}{k}$  inst<sup>n</sup>,  $\frac{1}{k} = \frac{1}{k}$



# GATE 1998



# GATE 1999

Which of the following is/are advantage(s) of virtual memory?

- ~~A.~~ Faster access to memory on an average.
- ☒ B. Processes can be given protected address spaces.
- C. Linker can assign addresses independent of where the program will be loaded in physical memory. ✓
- D. Program larger than the physical memory size can be run. ✓



<https://t.me/UnacademyGATECS>







Use Code:  
**VDEEP10**

**NEW  
BATCH  
ALERT**

**EVOLVE FOR  
GATE 2022**

**COMPUTER SCIENCE & IT**

**BATCH - Y**



**SANCHIT JAIN**



**RAVINDRABABU  
RAVULA**



**SUBBA RAO**



**VENKATA RAO**



**VISHVADEEP  
GOTHI**



**SWETA KUMARI**



**UMAMAHESWARA  
RAO**

**WE START WITH**

**COMPILER DESIGN**  
by **Sweta Kumari**

**06:00 PM**

FOR 10% DISCOUNT

USE CODE

START DATE

**04  
AUG  
2021**



## GATE & ESE subscription

PLUS

ICONIC

No cost EMI available on 6 months & above subscription plans

<input checked="" type="radio"/>	24 months	60% OFF	₹42,480 <del>₹47,200</del>	₹1,770 per month
<input type="radio"/>	18 months	53% OFF	₹37,170 <del>₹41,900</del>	₹2,065 per month
<input type="radio"/>	12 months	45% OFF	₹29,205 <del>₹32,450</del>	₹2,434 per month
<input type="radio"/>	6 months	10% OFF	₹23,985 <del>₹26,650</del>	₹3,998 per month
<input type="radio"/>	3 months		₹13,275 <del>₹14,750</del>	₹4,425 per month

To be paid as a one-time payment



VDEEP10 ×

Awe-some! You got 10% off

Proceed to pay

## GATE & ESE subscription

PLUS

ICONIC

No cost EMI available on 6 months & above subscription plans

<input checked="" type="radio"/>	24 months	26% OFF	₹66,600 <del>₹74,000</del>	₹2,775 per month
<input type="radio"/>	18 months	14% OFF	₹58,050 <del>₹64,500</del>	₹3,225 per month
<input type="radio"/>	12 months		₹45,225 <del>₹50,350</del>	₹3,769 per month

To be paid as a one-time payment



VDEEP10 ×

Proceed to pay

VDEEP10



## Campus Placements - IT Jobs

# Free Personal Mock Interview & Group Discussion



Offer valid on Plus  
Subscription till 4th August

360° Support To Crack TCS, Infosys, Cognizant  
And Other Exams!



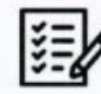
Live Project Opportunity



A to Z: Technical  
Skills



Aptitude Development



Weekly Mock Tests



Soft Skills & Interview Guidance





**UNACADEMY  
COMBAT**



ME



CE



EE



ECE



CS & IT

 unacademy

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**

**AUGUST 1, 8, 15 | Starts at 11 AM**





Unacademy  
Subscription

**RANK 1-3**

✓ Complimentary  
Unacademy Plus  
subscription for One Year



Unacademy  
Subscription

**RANK 4-10**

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



Unacademy  
Subscription

**RANK 11-50**

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



Unacademy  
Subscription

**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*







