

CS-24: Operating Systems Concepts with Unix / Linux.

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Unit 1: Introduction, Process and Thread, Process Scheduling

1. **Q:** What is an Operating System?
A: It is system software that manages hardware and software resources.
 2. **Q:** Name one function of an OS.
A: Memory management.
 3. **Q:** What is context switching?
A: It's the process of storing and restoring the state of a CPU so execution can resume from the same point later.
 4. **Q:** What is a thread?
A: A thread is the smallest unit of a process that can be scheduled and executed.
 5. **Q:** Name any two CPU scheduling algorithms.
A: FCFS and Round Robin.
 6. **Q:** What is the full form of FCFS?
A: First Come First Serve.
 7. **Q:** What does SJN stand for?
A: Shortest Job Next.
 8. **Q:** What is a Process Control Block (PCB)?
A: A PCB stores information about a process like its state, program counter, etc.
 9. **Q:** What is the main benefit of multithreading?
A: Efficient CPU utilization.
 10. **Q:** What is the difference between preemptive and non-preemptive scheduling?
A: Preemptive allows interruption; non-preemptive does not.
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Unit 2: Deadlocks, Memory Management

1. **Q:** What is a deadlock?
A: A situation where a set of processes are blocked as each process is holding a resource and waiting for another.
2. **Q:** Mention one method to avoid deadlock.
A: Deadlock avoidance using Banker's algorithm.
3. **Q:** What is fragmentation in memory?
A: It refers to the unused memory spaces created in the system.
4. **Q:** What is the difference between internal and external fragmentation?
A: Internal is within allocated space; external is between allocations.
5. **Q:** What is virtual memory?
A: It's a technique that gives an application the impression it has contiguous memory.
6. **Q:** Name one virtual memory technique.
A: Paging.
7. **Q:** What is the purpose of memory allocation?
A: To assign memory blocks to programs and data.
8. **Q:** What is segmentation?
A: A memory management technique dividing memory into segments.

9. **Q:** What is the role of the Memory Manager in OS?
A: It handles allocation and deallocation of memory.
 10. **Q:** Define non-contiguous memory allocation.
A: Memory is assigned in separate blocks, not in sequence.
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Unit 3: Getting Started with Unix, Unix Shell Command

1. **Q:** What is the purpose of the `pwd` command?
A: It prints the current working directory.
 2. **Q:** Name any two Unix shells.
A: Bourne Shell (sh), Korn Shell (ksh).
 3. **Q:** What does `chmod` do?
A: It changes file permissions.
 4. **Q:** What is the use of the `grep` command?
A: It searches for patterns in files.
 5. **Q:** Which command is used to create a new directory?
A: `mkdir`
 6. **Q:** What does the `ps` command do?
A: It displays information about running processes.
 7. **Q:** What symbol is used for piping in Unix?
A: `|` (pipe)
 8. **Q:** What is the function of the `telnet` command?
A: It allows remote login to another system.
 9. **Q:** What does `ls -l` display?
A: A long listing of files with permissions and details.
 10. **Q:** What is a device file in Unix?
A: A file that represents hardware devices.
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Unit 4: Text Editing with vi and nano Editor, Shell Programming

1. **Q:** Which command opens a file in `vi` editor?
A: `vi filename`
2. **Q:** What is the command to save and exit in `vi`?
A: `:wq`
3. **Q:** What is a shell script?
A: A file containing a sequence of shell commands.
4. **Q:** What does `echo $HOME` display?
A: The path of the user's home directory.
5. **Q:** Name any two shell variables.
A: PATH, HOME
6. **Q:** What is the purpose of `read` in shell scripts?
A: To take user input.
7. **Q:** What is a positional parameter?
A: Arguments passed to a script, like `$1`, `$2`.
8. **Q:** Which symbol is used to define a variable?
A: `=` (equal sign)

9. **Q:** What does **IFS** stand for in shell scripting?
A: Internal Field Separator.
10. **Q:** Which editor is easier for beginners: vi or nano?
A: **nano**

Unit 5: Getting Started with Linux, Linux Booting, Linux Admin (Ubuntu)

1. **Q:** What is the full form of GNU?
A: GNU's Not Unix.
2. **Q:** What is the purpose of the GRUB loader?
A: It loads the OS during the booting process.
3. **Q:** Name a popular Linux distribution.
A: Ubuntu.
4. **Q:** What is WINE used for?
A: To run Windows applications on Linux.
5. **Q:** What command is used to shut down Linux?
A: **shutdown**
6. **Q:** What is the default file system used by Ubuntu?
A: ext4.
7. **Q:** What is Open Source software?
A: Software whose source code is publicly available.
8. **Q:** What is the purpose of Samba Server?
A: To share files and printers between Linux and Windows.
9. **Q:** How do you create a user in Linux?
A: Using the **adduser** or **useradd** command.
10. **Q:** What is the function of a Linux firewall?
A: It controls incoming and outgoing network traffic.

♦ UNIT :- 1

1. **OS** – Operating System
2. **PCB** – Process Control Block
3. **CPU** – Central Processing Unit
4. **FCFS** – First Come First Serve
5. **SJN** – Shortest Job Next
6. **FIFO** – First In First Out
7. **RR** – Round Robin
8. **PCB** – Process Control Block
9. **IPC** – Inter-Process Communication
10. **IO** – Input/Output

♦ UNIT :- 2

11. **RAM** – Random Access Memory
 12. **ROM** – Read Only Memory
 13. **MMU** – Memory Management Unit
 14. **VMM** – Virtual Memory Management
 15. **DMA** – Direct Memory Access
 16. **LRU** – Least Recently Used (Page Replacement)
 17. **FIFO** – First In First Out (Page Replacement too)
 18. **TLB** – Translation Lookaside Buffer
 19. **OSPF** – Open Shortest Path First (conceptually in networks too)
 20. **MBR** – Master Boot Record
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♦ **UNIT :- 3**

21. **CLI** – Command Line Interface
 22. **GUI** – Graphical User Interface
 23. **UID** – User Identifier
 24. **GID** – Group Identifier
 25. **pwd** – Print Working Directory
 26. **cd** – Change Directory
 27. **ls** – List
 28. **mv** – Move
 29. **cp** – Copy
 30. **rm** – Remove
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♦ **UNIT :- 4**

31. **BIOS** – Basic Input Output System
 32. **GRUB** – GRand Unified Bootloader
 33. **LILLO** – Linux Loader
 34. **GNU** – GNU's Not Unix
 35. **GPL** – General Public License
 36. **FSF** – Free Software Foundation
 37. **WINE** – Wine Is Not an Emulator
 38. **SUDO** – Super User Do
 39. **SSH** – Secure Shell
 40. **FTP** – File Transfer Protocol
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♦ UNIT :- 5

- 41. **IFS** – Internal Field Separator
 - 42. **PS1, PS2** – Prompt Statement 1, 2
 - 43. **TERM** – Terminal
 - 44. **MAIL** – User Mailbox Variable
 - 45. **PATH** – Search Path Environment Variable
 - 46. **HOME** – User's Home Directory
 - 47. **LOGNAME** – Login Name
 - 48. **IFS** – Internal Field Separator
 - 49. **bc** – Basic Calculator
 - 50. **ps** – Process Status
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FILL - IN - BLANKS

✔ Unit 1:

- 1. An _____ acts as an interface between user and hardware.
→ **Operating System**
 - 2. The _____ manages the execution of processes in the system.
→ **CPU Scheduler**
 - 3. The full form of FCFS is _____.
→ **First Come First Serve**
 - 4. In _____ scheduling, each process gets an equal share of CPU time.
→ **Round Robin**
 - 5. The data structure that holds process information is called _____.
→ **Process Control Block (PCB)**
 - 6. A process in the _____ state is currently being executed.
→ **Running**
 - 7. _____ is the process of switching CPU from one process to another.
→ **Context Switching**
 - 8. Threads are also known as _____ threads of control.
→ **Lightweight**
 - 9. The benefit of multithreading is improved _____.
→ **CPU utilization**
 - 10. _____ scheduling does not allow interruption of running processes.
→ **Non-preemptive**
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✔ Unit 2:

- 1. A _____ occurs when two or more processes wait indefinitely for each other.
→ **Deadlock**
- 2. The method to check for deadlock is called _____.
→ **Deadlock Detection**

3. Internal fragmentation wastes memory _____ allocated blocks.
→ **Inside**
 4. Virtual memory uses _____ to manage memory.
→ **Paging**
 5. _____ memory allocation assigns memory in non-contiguous blocks.
→ **Non-contiguous**
 6. The page replacement algorithm LRU stands for _____.
→ **Least Recently Used**
 7. In segmentation, memory is divided into logical _____.
→ **Segments**
 8. A memory management technique that allows programs to exceed physical memory is _____.
→ **Virtual Memory**
 9. _____ allocation assigns memory in a continuous manner.
→ **Contiguous**
 10. _____ and _____ are two types of fragmentation.
→ **Internal, External**
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✓ Unit 3:

1. The command to list files is _____.
→ **ls**
 2. The command to print the current directory is _____.
→ **pwd**
 3. _____ is used to change file permissions.
→ **chmod**
 4. A file that represents hardware in Unix is a _____ file.
→ **Device**
 5. The symbol used for piping is _____.
→ **|**
 6. The command used to compare two files is _____.
→ **diff**
 7. _____ is used to search patterns in files.
→ **grep**
 8. The _____ command shows currently running processes.
→ **ps**
 9. The Unix shell that is widely used for scripting is _____.
→ **Bourne Shell (sh)**
 10. The command used to log out from shell is _____.
→ **logout**
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✓ Unit 4:

1. To open a file in vi editor, use the command _____.
→ **vi filename**
2. The command **:wq** in vi is used to _____ and _____ the file.
→ **save, exit**

3. _____ are used to store values in shell scripts.
→ **Variables**
 4. The positional parameter **\$1** refers to the _____ argument passed to a script.
→ **first**
 5. The command used to read user input is _____.
→ **read**
 6. _____ is a beginner-friendly text editor in Unix.
→ **nano**
 7. _____ is used to echo text on the terminal.
→ **echo**
 8. The keyword used to define functions in shell is _____.
→ **function**
 9. The loop that repeats a block of code for a fixed range is _____.
→ **for loop**
 10. _____ separates words in shell based on the IFS value.
→ **Whitespace or Field Separator**
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✓ Unit 5:

1. GRUB stands for _____.
→ **Grand Unified Bootloader**
2. The command to shut down Linux is _____.
→ **shutdown**
3. The Linux firewall is called _____.
→ **UFW (Uncomplicated Firewall)**
4. The Linux loader other than GRUB is _____.
→ **LILO**
5. The default Linux file system is _____.
→ **ext4**
6. WINE allows running _____ applications on Linux.
→ **Windows**
7. The Samba server is used for _____ sharing.
→ **File and Printer**
8. A user in Linux can be created using the _____ command.
→ **adduser / useradd**
9. The root user in Linux has _____ privileges.
→ **administrative**
10. The full form of GNU is _____.
→ **GNU's Not Unix**