

Q-1 (A)

1. Shortest Job First
2. FCFS - First come First serve
3. Process Control Block

Q-1 (B)

- I. Context Switching is the process of storing and Restoring the state of CPU
 - So that execution can be resumed the same point later.
 - This allows multiple processes to sharing a single CPU.
 - The execution of the end process starts at the point process stopped it.

Q-1 (C)

I. Round Robin

- Round Robin is the preemptive process algorithm
- Each process is provided a fix time to is called a quantum
- Once a process is executed for a given time period.
- other process executes for time period.

Process ID	Arrival Time	Burst Time
P1	0	5 (2)
P2	2	3
P3	3	2
P4	1	3

Quantum :- 3

Step-1	Gantt	P1	P4	P2	P3	P1	
		0	3	6	4	11	13

Step-2 Turn Around Time = Completion Time - Arrival Time
 Waiting Time = Turn Around Time - Burst Time

PID	Arrival Time	Burst Time	Completion Time	Turn Time	Waiting Time
P1	0	5	13	13	8
P2	2	3	4	7	4
P3	3	2	11	8	6
P4	1	3	6	5	2

Step-3 AvgTAT = Total TAT / No. of Process

$$(8 + 4 + 6 + 2) = 33 / 4 = 8.25$$

Step-4 Throughput = Total Burst T / No. of Process

$$(5 + 3 + 2 + 3) = 13 / 4 = 3.25$$

Step-5 CPU Utilization = Total ET / TE * 100

$$13 / 13 * 100 = 100\%$$

Q-1(A)

1. A software that allows a user to run other application on computing device.
2. Waiting Blocked
3. Instance of a computer that is being executed.

Q-1(B)

1. Start :- This is the initial state when a process is first started / created.
- Ready :- The process is waiting to be assigned to a processor.
- Process :- may come into this state after start.
- Running :- state is set to running and processor execute its instructions.
- waiting :- Process moves into the waiting state if it needs to wait for a resource.
- Terminated or Exit :- Once the process finishes its execution or it is terminated by the OS.

Q-1(C)

1. FCFS

- First Come First Serve scheduling algorithm as the name suggests that process which arrives first.

PID	AT	BT
P1	0	5
P2	2	3
P3	6	2
P4	7	3

Step -1 Gantt chart

P1	P2	P3	P4	
0	5	8	10	13

Step-2	PID	AT	BT	CT	TAT	WT
	P1	0	5	5	5	0
	P2	2	3	8	6	3
	P3	6	2	10	4	2
	P4	7	3	13	6	3

Step-3 $\text{Avg TAT} = \text{Total TAT} / \text{No. of Process}$
 $(5+4+6+6) / 4 = 21 / 4 = 5.25 \text{ ms}$

Step-4 $\text{Avg WT} = \text{Total WT} / \text{No. of Process}$
 $(0+3+2+3) / 4 = 8 / 4 = 2 \text{ ms}$

Step-5 $\text{Throughput} = \text{Total BT} / \text{No. of Process}$
 $(5+3+2+3) / 4 = 13 / 4 = 3.25 \text{ ms}$

Step-6 $\text{CPU Utilization} = \text{Total ET} / \text{Total ET} * 100$
 $13 / 13 * 100 = 100\%$

Q-2 (A)

1. Two or more process are blocked indefinitely because each process is waiting process.
2. Storage space is used inefficiently, reducing capacity or performance.
3. Paging is Memory Management technique in which a computer stores and main memory.

Q-2 (B)

I. Deadlock Prevention aims to ensure that at least one of the necessary conditions for deadlock can't hold.

- Mutual Exclusion :- Make resource shareable
- No Preemption :- Allow Preemption of resources
- Circular wait :- Impose a total ordering on resource type and require process order.

Q-2 (C)

1. Contiguous Memory Allocation

- Contiguous memory allocation is a classical memory allocation model that assigns a process blocks.

- Contiguous Memory allocation is one of the oldest allocation
- when a process needs to memory is requested by the process
- if sufficient contiguous memory is found, the process is allocated memory to start its execution.
- otherwise it is added to a queue of waiting process until free memory is available.
- Single Position allocation
- Multiple position allocation
- Dynamic Allocation Algorithms

NonContiguous memory allocation

- The nonContiguous Memory allocation memory allocation, a process will acquire the memory space.
- It is not at one place it is at the different locations according to the process requirement
- This technique of non-Contiguous Memory allocation reduces the wastage of memory fragmentation.
- the utilize all the free memory space is granted by a process.

Q-2 (A)

1. Frames
2. Due to the allocated larger than the request memory.
3. Simultaneous Multithreading

Q-2 (B)

Paging

- Divides memory into fixed size blocks
- Logical address space memory ~~is~~ non-contiguous

Segmentation

- Divides memory into variable size block
- Logical address space is contiguous

Q-2 (C)

Physical Memory Management

- Physical memory is the actual Real Memory used in Ram.
- Physical memory is the only memory that is directly accessible CPU.
- CPU reads the instructions stored in the physical.

- CPU reads the instructions - stored in the physical
- execute them continuously
- The data that is operated will also be stored physical memory in uniform manner.

Virtual Memory

- Virtual memory as the OS uses virtual memory as a memory management technique.
- which non-contiguous memory is presented to software contiguous memory
- virtual addresses are mapped into real addresses. virtual memory is one classification of memory which was created by hard disk.
- simulation additional Ram, the addressable space available for users.

Q-3 CA)

1. Dennis Ritchies and Ken Thompson at Bell Labs
2. Sh
3. exth, xfs, 2FS

Q-3 CB)

1. C shell (csh) : Has a syntax similar to the C programming language.
- ~~Boone~~ Bourne shell (Bsh) : An enhanced version of shell
- Bourne-Again shell (Bash) :- The default shell on most Linux system.
- z shell (zsh) :- An extended Bourne shell with many improvements

Q-3 CC)

1. It will put filename into a buffer and display the put filename into a buffer and display the file on the screen.
- if the file is bigger then the screen can display.
- The screen will act as a window into file

- At the beginning of a session, the screen will display the first part of file.
- If file name does not exist, vi will create it.
- Screen editors are also called display editors, or visual editors.
- vi is one of the more popular screen editors that run on the Unix system.
- Modes of vi editor :-

one of the most aspects to remember about vi is that most of these modes

- (1) Command Mode :- This is the default mode of vi editor.
- (2) Input or Insert Mode :- This mode is used to insert text in vi editor.
- (3) Execute Mode :- This mode is used to save or quit from vi editor.

Q-3 (A)

1. The Bourne shell was written by - Stephen Bourne at Bell labs.
2. Bash - Bourne - Again's shell
3. How many Types of Permission in linux & is
Read (r) , write (w) , execute (x)

Q-3 (B)

Cat :- This command is generally used to create a file see the content of the file and append data to a file

Sy 1 :- \$ cat > filename

Ex :- \$ cat > abc.txt hi
 hello

Q-3 (C)

1. CMP - This cmd compares two files byte by byte, that means the first byte of first file with the first byte of the second file, if both are same it checks the next bytes

- Wherever the bytes are not same it displays the message.
- Second file differs :- byte number, line number as shown below.

★ &Ex &cmp file1 file2

File 1 File2 differ : byte 13 , line 1

- Comm :- This cmd is useful to compare two sorted file line by line.
 - The output of Comm Cmd consists of three columns, the first column is the lines which are unique to the file.
 - The Second column displays the line which are unique to the Second file and the third column lines the file.
- Diff :- This Cmd finds difference between two files.
- diff Cmd compares File 1 and File 2 if both file 1 and File 2 are directories, diff Cmd compares corresponding files in both directories in order.
- Sy & Ex :-
diff File1 File 2

Q-4 (A)

1. Shell variables store data within the shell environment used to store value for use in scripts.
2. If, for
3. The test cmd (or []) is used to evaluate expressions and return a status code

Q-4 (B)

1. \$0 : The name of script itself.
\$1, \$2, \$3 :- The first, second, third cmd-line arg
\$# :- The number of cmd-line arg
\$* :- All cmd-line arguments as single string
\$@ :- All cmd-line arguments as separate words

Q-4 (C)

1. #! /bin /bash
while true ; do
clear # clear the screen
date + "%I %P" # display the current time
HH:MM:SS
sleep 1 # wait for 1 second
done

Q Output :-

14 : 35 : 24

14 : 35 : 28

14 : 35 : 29

Q-4 (A)

1. -lProc Specifically, lProc1 Cpnifo for processes information
2. How many types of looping structure in is for, while, until
3. System variable are pre-defined variable in the shell environment that control the system and shell.

Q-4 (B)

1. Decision on statements in Unix shell scripting allow for conditional execution of code based on whether a condition is true or false.
- The primary decision statement is the if statements.

Q-4 CC)

- Nano is simple text editor
- It was created as part of the GNU Project started by Richard Stallman.
- Most Linux distribute vi and for vimeditors
- And you can always download the emacs
- But both of these editors take some time to learn.
- But it is great for people who are just work with Unix
- For who want to create a file quickly with a minimum of fuss.
- Running Nano :- To run nano you type followed by the name of file
- Nano filename :- If the file does not yet exist it will be created for you.
- So if I wanted to create a file named bush - profile.
- Nano forward :- This will bring up a text window with the name of the file on the top line.

Q-5 (A)

1. GPL - General Public License
2. Write syntax to add users to particular group
`sudo usermod -G groupname username`
3. UFW - Uncomplicated Firewall.

Q-5 (B)

- | 1. LILO | GRUB |
|---|--------------------------------------|
| • Linux loader | • Grand unified Boot Loader |
| • lilo and not boot from network | • GRUB boot from network |
| • lilo only support upto different boot selection | • GRUB support for unlimited entries |

Q-5 (C)

1. A Samba file server enables file sharing across different OS over a network.
 - It lets you access your desktop file from a laptop and share file with windows and macs users.

Installing Samba

\$ sudo apt update

\$ sudo apt install samba

\$ where is samba

Setting up Samba

\$ mkdir /home/ <username> / Samba share /

the cmd create new folder samba share in our home directory which will share later.

The configuration file for Samba is located at /etc / Samba / smb.conf.

→ \$ sudo nano /etc / Samba / smb.conf

At the bottom of the file, add

Comment = Samba on Ubuntu.

path = /home / username / Samba share

read only = no

browseable = yes.

Path: The directory of our share

Q-5(A)

1. Uncomplicated firewall
2. wine is not an Emulator
3. List the special three sections of the smb.conf file → [global], [homes], [printers]

Q-5(B)

1. A firewall is a network security system that monitors and controls incoming and outgoing network traffic based on predefined security rules.
- In linux, UFW a common and user-friendly firewall tool.

Q-5(C)

1. Make super user
- open terminal and use following cmd to make yourself a super user cmd - \$sudo s
- \$sudo apt update.
 - Install Apache:-

- The status of Apache server can be checked by using the following cmd).

- STATUS apache 2:- open the browser and type localhost or 127.0.0.1 on the address bar.

- It will display the default page of the Apache server.

- Adjusting the firewall:-

\$ sudo ufw app list.

\$ sudo ufw allow apache

\$ sudo ufw status.

- Managing Apache process:-

\$ sudo systemctl stop apache2

\$ sudo systemctl start apache2

\$ sudo systemctl restart apache2

\$ sudo systemctl reload apache2

\$ sudo systemctl enable apache2

\$ sudo systemctl disable apache2

- # This is change Linux uses password

\$ sudo passwd abc