VIII. Resources required (Additional)-Nil

Create the following structure

```
mkdir MSBTE
cd MSBTE
mkdir Ischeme
mkdir Gscheme
cd Ischeme
cat > CO5I
cat > IS I
cat > CMSI
dd...
cd Gscheme
cat > CM5G
cd..
```

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XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. How to shift from Root directory to User (Home) directory?
2. How to see directories?
3. What is default set of permissions given by the system to the directory?
4. Assign all the permissions to your directory for all the users using symbolic and octal method.
5. What is difference between comm and cmp command?

(Space for answer)

1. How to shift from Root directory to User directory?

We can shift from root directory to user (name) directory by cd ... command

2. How to see directories?

With the pwd command (present Working directory). This is most used Linux command to see the specific Unix directory on which the user is working on.

3. What is default set of permissions given by the system to the directory?

The default set of permissions given to the directory drwxrwxr-x

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Q4 - Assign all the permissions to your directory for all the users using symbolic & actual method.

→ Symbolic method
chmod a+rwx abc
assigns all the permission to abc directory for all the users.
Octal method
chmod 777
It assigns all the permissions for the users.

XIII. Exercise:

1. Write the command for performing the following tasks sequentially
   a. Display your current directory.
   b. Create a directory 'subject' in the current directory.
   c. Create a file 'sample' in the directory 'subject'.
   d. Remove the write permission for the owner for 'sample' using symbolic method.
   e. Delete the file 'sample'. What is an error message displayed?

2. What are the permissions assigned to the file/files after execution of following commands?
   a. $chmod 700 abc
   .....
   b. $chmod u+rwx, go-rwx file1 file2
   .....
   c. $chmod 536 xyz
   .....

3. Create new files pqr and prq1.
   Perform the commands
   $chmod ugo=r pqr
   o/p. assigns read permission for all 3 users &
   $chmod ugo+r pqr1
   o/p. assigns read permission for all 3 users for file pqr1

4. Assign read and write permission for the owner, write permission for the group and execute permission for others using octal method for file mfile.

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5. Write commands to assign following permissions to the file OSY using octal method.
   a. _ _ _ _ _ _ _ _ _ _
   b. _rw_r_xr_ _
   c. _r_xr_xr_x

6. Write commands to assign following permissions to the file OSY using symbolic method.
   a. _rwxr_xr_ _
   b. _rwxrwxrwx

(Space for Answer)

Q1. Write the command for performing fall tasks
a) pwd command is used
b) mkdir subject
c) cd subject
cat > sample
d) chmod u-w sample
e)

Q2. What are the permissions assigned file of the execution of fall. command.

a) It assign all permissions for user, no permissions for group & others for file
b) All read, write & execute permissions for owner of file1 & removes read, write & execute from all 2 users & remover remaining permissions
c) Assign read & write permission to user, read permission to group & read & write permissions for others for file xyz

Q4. Chmod 621 mfile

Q5 Write commands to assign fall permissions to file OSY
a) chmod 654 OSY
b) Chmod 555 OSY

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Q6. Write commands for fall using symbolic method
a) Chmod u+rwx, g+rx, o+r o+x
b) Chmod ugo+rwx.

XIV. References/ Suggestions for Further Reading

1. https://www.tutorialspoint.com/unix/
2. http://www.ee.surrey.ac.uk/Teaching/Unix/
3. https://www.cs.sfu.ca/~ggbaker/reference/unix/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related (15 Marks)		**30%**
1.	Logic formation	10%
2.	Debugging ability	10%
3.	Follow ethical practices	10%
Product related (35 Marks)		**70%**
4.	Expected output	30%
5.	Timely Submission	30%
6.	Answer to sample questions	10%
Total (50 Marks)		**100%**

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List of Students /Team Members

1. .....
2. .....
3. .....

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	
14	34	48	Saman 14/8/19

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VIII. Resources required (Additional)

Sr. No.	Name of Resource	Broad Specification	Quantity	Remarks (If any)
1	Computer System	Processor (i3-i5), RAM-2GB and above (As per need of OS)	As per batch Size	For all Experiments
2.	Operating System	Unix/Linux/Ubuntu/any other open sources operating system		

IX. Resources used (Additional)

Sr. No.	Name of Resource	Broad Specification	Quantity	Remarks (If any)
1	Computer System	Processor (i3-i5) RAM-3GB, Windows 7	1	–
2.	Operating System	Ubuntu		

X. Program Code: Teacher must assign a separate program statement to students.

Write the commands for:
Counting number of words in the 'data.txt'
Counting number of lines in 'data.txt'
Counting all characters in the 'data.txt'

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XI. Result (Output of Command):

.....
.....
.....
.....

XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. Give Applications of Paste Command.
2. How to move cursor to end of a line?
3. What are the options of wc command?
4. What are different types of filters used in Linux?
5. What is difference between $cat abc and $cat abc|more (File abc shall consists of more than 25 lines in it)

(Space for answer)

1. Give applications of Paste Command
→ Paste command is one of the useful command

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in Unix or Linux OS. It is used to join files horizontally by outputting lines consisting of lines from each file specified, separated by tab.

Q2. How to move cursor to end of line.
→ By using G option with more command user can move cursor to end of line.

Q3. What are the option of wc command?
→ -l → counts only no. of line
-w → counts only no. of words
-c → counts only no. of characters.

Q4. Different types of filters used in Linux?
→ Awk command, sed, Grep, Egrep, Fgrep, Rgep head, tail, sort, uniq, fmt commands are filters in Linux.

Q5. What is difference between cat abc & cat abc/more
→ Cat abc will be display only contents on the screen but cat abc /more will scroll off the screen when file is displayed.

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XIII. Exercise:

1. Write the significance of following.
   i. **Only one character is specified**
   $ paste -d "|" number state capital
   1|Arunachal Pradesh|Itanagar
   2|Assam|Dispur
   3|Andhra Pradesh|Hyderabad
   4|Bihar|Patna
   5|Chhattisgrah|Raipur

   ii. **More than one character is specified**
   $ paste -d "|," number state capital

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1|Arunachal Pradesh,Itanagar
2|Assam,Dispur
3|Andhra Pradesh,Hyderabad
4|Bihar,Patna
5|Chhattisgrah,Raipur

iii. -s (serial), Combination of -d and -s, –version (write its syntax and example)

1. Create a new file and practice executing shell commands from within the editor. Capture the results of some shell commands into the file.
2. How to get help?

2. Try the commands and write output with its meaning

i. tr "[a-f]" "[0-5]" < employee (employee is name of file)

In the file employee the letters from a-b will be replace with 0-5 respect way

ii. tr -s " " < employee

iii. tr -d "f" < employee

It will discard the letter 'f' present in file employee.

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(Space for Answer)

1. Write the significance of following
i) Only one character will be displayed before first & word & second to other, mainly words.

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Q1. Create a file as & type all least 30 line in it.

→ vi as

=
=
=

30 line

OS [new file]

Q2. Write command to save the file

→ :wq is the command to save the file.

Q3. Write command to insert text at the end of line.

→ A is the command used to insert text at the end of line.

Q4. Replace some character into beginning of second line.

→ S command is used to replace character into begining of second line.

Q5. Write a command to delete 10 lines at a time.

→ To delete 10 line at a time 10dd command is used.

Q6. Write a command to move cursor 3 word to the right.

→ 3l command is used to move cursor 3 word to the right.

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X. **Program Code: Teacher must assign a separate program statement to students.**

Create a file OS and type at least 30 lines in it.

i) Write command to save the file
ii) Write the command to insert text at the end of line.
iii) Replace some character into beginning of second line.
iv) Write a command to delete 10 lines at a time.
v) Write a command to move cursor 3 word to the right

XI. **Result (Output of Code):**

.....

.....

.....

.....

XII. **Practical Related Questions**

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. What is the difference between Type o and Type O?
2. State the three ways quit the vi-editor.
3. What is effect of (Type this at colon mode and observe the changes in your file)
   a. set nu
   b. set ic
   c. set nonu
   d. set noai
4. Give vi command to delete line to the left of cursor.
5. What is difference between yank and delete?
6. What are different modes in Vi editor?
7. Observe the output of following commands:

   i) at colon mode
   :abbr MSBTE Maharashtra State Board Of Technical Education
   Now in the beginning of your file type MSBTE and press space bar
   Write down the output

   .....

   ii) Go to beginning of your file press 4YY
   Then move to end of your file and press 'P'
   Write the purpose of the command

(Space for answer)

Q1. The Type o opens line below & Type O opens line above

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Q2.
→ :x → saves file & quits editing mode
:wq → saves & quits editing mode
:q → quits editing mode without saving

Q3. What is the effect of
→ i) set nu
→ It sets the no. for each line.

ii)
→

iii) set nonu
→ removes the no from each line.
iv) set noai
→

Q4. Give vi command to delete line to the left of cursor
→ X command is used to delete the line to left of cursor.

Q5. Give diff betn yank & delete?
→ yank - you can copy the lines or words from one place & then you can paste them at another place.
delete - It used to delete words or lines,

Q6. What are diff modes in vi editor?
→ Command mode, insert mode & ex mode

Q7 → Maharashtra State Board of Technical E
→ Copies the current & next 4 line & paste at the end of file

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XIII. Exercise:

1. Write the significance of following.
   i. $ vi temp.txt
   ii. Insert multiple lines.
   iii. Delete contents using commands.
2. Create a new file and practice executing shell commands from within the editor. Capture the results of some shell commands into the file.
3. How to get help?

(Space for Answer)

Q1.

i) vi temp.txt
- Creates empty temp.text file.

ii) insert multiple lines
- go to Insert mode & insert lines.

iii) delete contents using commands
- using x commands.

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Pratical related Questions

A) Write & execute script for nested if stmt

→
```
# //bin/bash
count = 99
if [$ count -eq 100]
then
echo "count is 100"
if [$count -gt 100)
then
echo "count is greater than 100"
else
echo "count is less than 100"
fi.
```

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X.

Execute shell script by considering eg to find passing grades of students

```
#!/bin/bash
grade =94
if [$ grade -gt 85]
then
echo "distinction"
else
if [$ grade -gt 60] ; then
if [$ grade -lt 85] ; then
echo "first class"
else
if [$grade -gt 45] ; then
if [$grade -lt 60] ; then
echo "second class"
else
echo "fail"
fi
fi
fi
```

XI.

XII.

(Space for answer)

c] Write script for finding greatest no. among given 3 no.

→

```
# bin / bash
echo "enter first number"
read first
echo "enter second no"
read first
echo ~~sec~~ "enter third no"
read third
if [$first -gt $sec] ; then
if [$first -gt $third] ; then
echo -e "$first is greatest"
else
echo -e "$third is greatest"
fi
else if [$sec -gt $third] ; then
echo -e "$sec is greatest
else echo -e "$third is greatest"
fi fi
```

XIII. **Exercise:**

1. Correct the following script and write its output.
   1. if [! -r "$1"] then echo "File $1 is not readable – skipping."; fi
   2. if ["$X" -nt "/etc/passwd"]; Then
      echo "X is a file which is newer than /etc/passwd"
      if

(Space for Answer)

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XI. Result (Output of Code):

.....

.....

.....

.....

XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. Give output of the following

a.

```
#!/bin/sh
NUMBERS="1 2 3 4 5 6 7"
for NUM in $NUMS
do
    Q=`expr $NUM % 2`
     if [ $Q -eq 0 ]
     then
            echo "Number is an even number!!"
    continue
    fi
    echo "Found odd number"
done
```

b.

```
#!/bin/sh
a=0
while [ $a -lt 10 ]
do
  echo $a
            if [ $a -eq 5 ]
    then
    break
    fi
a=`expr $a + 1`
done
```

2. State the difference between Iteration and Recursion.
3. Write a shell script to display Fibonacci series for n numbers.
4. Write a shell script to display tables of 2 to 10 numbers. (Like 2 * 1 = 2)
5. Write a shell script to accept five digit number and perform addition of all digits.

(Space for answer)

1. Give output of the foll.

a) If no. like 2, 4, 6 comes it will display no is an even no!! and if 1, 3, 5, 7 comes it will display found odd number.

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b.) if value of a is less than 10 then display a &
if a = 5 then a = a+1

Q4. → echo "Multiplication table"
echo "which table do yo want?"
read num
Iter = 1
while [$num -le 5 -a $iter -le 10]
do
res = [`exp $num \* $iter`]
echo $num "*" $iter "=" $res
iter = `expr $iter + 1`
done

Q5 → sum = 0
echo "enter the number"
read n
while [$n -gt 0]

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XIII. Exercise:

Execute the script for the following.

1. The for loop using day of week list.
2. The while loop to print different * patterns.
3. The case statement for performing various mathematical operations.

(Space for Answer)

Continued ...

do
temp = "expr $n % 10"
sum = `expr $sum + $temp`
n = `expr $n /10`
done
echo $sum

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• Execute the script for foll

1. The for loop using day of week list
now = date
For (i = 1 ; i <= date i++)

XIV. References/ Suggestions for Further Reading

1. https://www.tutorialspoint.com/unix
2. http://www.ee.surrey.ac.uk/Teaching/Unix/
3. https://www.cs.sfu.ca/~ggbaker/reference/unix/
4. https://www.cyberciti.biz/faq/bash-for-loop/
5. https://bash.cyberciti.biz/guide/For_loop

XV. Assessment Scheme

Performance indicators		Weightage
Process related (35 Marks)		**70%**
1.	Logic formation	30%
2.	Debugging ability	30%
3.	Follow ethical practices	10%
Product related (15 Marks)		**30%**
4.	Expected output	10%
5.	Timely Submission	10%
6.	Answer to sample questions	10%
Total (50 Marks)		**100%**

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List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related (35)	**Product Related (15)**	**Total(50)**	
34	14	48	18/9/19

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XI. Result (Output of Code):

.....

.....

.....

.....

XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. What is the command to run the script?
2. What are file test options with its meaning?
3. What will be the output of these commands (file=abc.txt)
   a) if [! -f "$file"]; then
      echo "$file"
      fi
   b) test -f "$file" || echo "$file"
   c) [-f "$file"] || echo "$file"

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(Space for answer)

Q1. What is the command to run the script?

→ ./filename .sh is the command to run the script.

Q2. What are the file test options with its meaning?

-b file - Checks if file is a block special file
-c file - checks if file is a char special file.
-d file - Checks if file is directory.
-f file - checks if file is an ordinary file as opposed.

Q3. What will be the output of these commands.

a) abc. text
b) true.

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```
done
if [$count -eq 0]
then
echo " No files found with executable rights"
fi
fi
```

Q3.

→
```
#!bin /bash
if [e $ file]
then
echo "the file exists"
else if [!-e $ file]
then
echo " file doesn't exist"
fi
if [!-w $file]
then { sudo chmod o+w$file } $$ echo "writable"
else if [-w $file] then
echo "already writable"
if [!-R $file]
then { sudo chmod u+r $file} && echo " readble"
else if [r $file] then
echo "already readable"
if [!-x $file]
then $ sudo chmod u +x $file} && echo " executable"
echo "already executable
fi
```

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XI. Result (Output of Code):

.....

.....

.....

.....

XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. What are permissions of a file?
2. How to assign permission to a file?
3. What happens when exception is thrown by main method?
4. How to check permissions of all files and directories?
5. What are the test commands to check the permission of a file?

(Space for answer)

Q1. What are permissions of a file?
→ read, write and execute are permissions of file.

Q2. How to assign permission to a file? ~~By use~~
→ By using chmod command we can assign permission to a file.

Q3. What happens when exception is thrown by main method?
→ If exception is thrown by main method it terminates the shell & print the exception message

Q4. How to check permissions of all file & directories?
→ By using ls -a command we can check permissions of all files & directories.

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Q.5. What are test commands to check permission of a file?

→ ls -a is the command to check permission of a file

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XIII. Exercise:

1. Write a shell script which displays the list of all executable files in the current working directory.
2. Write a shell script which displays a list of all the files in the current directory to which user has read, write and execute permission.
3. Write a shell script which accepts a filename and assigns it all the permissions.

(Space for Answer)

code attached.

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Date : / /

* Program code

```
# include <stdio.h>
int main()
{
int n, bt[20], wt[20], tat[20], quwt[20], avtat=0, i, j;
printf("enter total number of process (max 20]:");
scanf("%d", &n);
printf("enter process burst time");
for (i=0, i<n; i++)
{
printf("p[%d]:", i++);
~~for (~~ scanf("%d", &bt[i]);
}
wt[0]=0;
for (i=1; i<n; i++)
{
wt[i]=0;
for (j=0; j<i; j++)
wt[i] += bt[j];
}
printf("\n Process \t Burst time \t waiting time \t turn around time");
for (i=0; i<n; i++)
{ tat[i]= bt[i]+wt[i];
  awt += wt[i];
  avtat + tat[i];
printf("\n p[%d]\t \t %d \t \t %d \t \t %d", i+1, bt[i],
        wt[i], tat[i]);
  } avwt /= i;
    avtat /= i;
printf("\n\n Avg waiting time : %d", vg);
printf("\n Avg turn around time %d", avtat);
return0; }
```

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XI. Result (Output of Code):

.....

.....

.....

.....

XII. Practical Related Questions

Note: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. Compare SJF, Priority and RR with respect to turnaround time and average waiting time.
2. State the conditions for preemptive and non-preemptive scheduling algorithm.
3. Give the reason of problems arises in FCFS.
4. Write a formula for turnaround Time.
5. Write a formula for Average waiting Time.

(Space for answer)

Q1. Compare SJF, Priority & RR with respect to turnaround time & average waiting time.

→ Shortest job first
Shortest process are executed first & then followed by longer process.

→ Priority
The priority of a process can be selected basis on memory req. time req or user performance.

→ RR
Each process is served by the cpu for a fixed time quantum so all process are given same priority

Q2. State Conditions for pre-emptive & non-preemptive scheduling algo.

→ Pre-emptive scheduling allows a running process to be interrupted by a high priority process whereas in non pre-emptive scheduling any new process has to wait until the running process finishes its

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Q3 Give the reason of problem arises in FCFS

→ Convey effect in OS is associated with FCFS in which the whole OS slows down due to few slow process.

Q4 Write a formula for Turn around time.

→ Turn around time = Completion Time − Bus time.

Q5 Write a formula for average waiting time.

→ Waiting time = Turn around time − Bus time

Avg waiting time = $\frac{\text{addition of waiting time}}{\text{No of process}}$

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XIII. Exercise:

1 Draw the Gantt chart for above mention example.
2 The jobs are scheduled for execution as follows:
Solve the problem by using FCFS and preemptive SJF
Find Average waiting time using Gantt chart

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Process	Arrival Time	Burst Time
P1	0	10
P2	1	4
P3	2	14
P4	3	8

3 Calculate average waiting time using RR algorithm for the following set of processes with the length of the CPU burst time given in milliseconds. (Time quantum 20 ms)

Process	Burst Time
P1	12
P2	45
P3	78
P4	90

(Space for Answer)

Q2 FCFS

P1	P2	P3	P4

0 10 14 03 36

Process	completion time	TAT	WT
P1	10	10	0
P2	14	13	9
P3	28	26	12
P4	36	33	25

Avg waiting time = $\frac{0+9+12+25}{4}$ = 11.6 m/s

b] Pre-emptive SJF

P1	P2	P2	P2	P2	P2	P4	P1	P3

0 1 2 3 4 5 6 14 23 27

Process	CT	TAT	WT
P1	24	24	14
P2	20	19	15
P3	37	35	21
P4	14	11	6

Avg waiting time = $\frac{14+15+21+6}{4}$ = 14 m/s

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Q3

P1	P2	P3	P4	P2	P3	P4	P2	P3	P4	P3	P4	P4

0 12 12 62 72 92 112 132 137 157 177 195 215 217

WT = P1 = 12 P2 = 261 P3 = 316 P4 621

AWT = 4.025 ms

XIV References/ Suggestions for Further Reading

1. https://www.tutorialspoint.com/unix
2. http://www.ee.surrey.ac.uk/Teaching/Unix/
3. https://www.cs.sfu.ca/~ggbaker/reference/unix/

XV Assessment Scheme

	Performance Indicators	Weightage
	Process related (35 Marks)	**70%**
1.	Logic formation	30%
2.	Debugging ability	30%
3.	Follow ethical practices	10%
	Product related (15 Marks)	**30%**
4.	Expected output	10%
5.	Timely Submission	10%
6.	Answer to sample questions	10%
	Total (50 Marks)	**100%**

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List of Students /Team Members

1. .....
2. .....
3. .....

Marks Obtained			Dated signature of Teacher
Process Related(35)	**Product Related(15)**	**Total(50)**	
34	14	48	Bavak 25/9/19

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```
# include <Stdio.h>
int main ()
{
int i, j, n, a[50], frame[10], no, k, avai, count=0;
printf ("\n Enter the no. of pages :\n");
scanf ("%d", &n);
printf ("\n enter the page no :\n");
for (i=1 ; i<=n ; i++)
scanf ("%d", &a[i]);
printf ("\n enter the no. of frames");
scanf ("%d", &no);
for (i=0; i<no ; j++)
    frame [i] = -1;
    j=0;
    printf ("\t ref string \t page frames \n");
    for (i=1
```

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