CBCS SCHEME

USN | | | | | | | | | | |

20MCA12

First Semester MCA Degree Examination, July/August 2021
Operating System with UNIX

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions.*

1 a. What is an operating system? Explain with a neat diagram the component of operating system. **(10 Marks)**

b. What is process, process state and Process Control Block (PCB)? Describe the contents of PCB. **(10 Marks)**

2 a. Consider the following set of processes with given length of CPu burst. Draw the Gantt chart for SJF (Preemptive)2 SJF (Non Preemptive). Find the average waiting time for each scheduling algorithm.

Processes	P_1	P_2	P_3	P_4	P_5
Burst time	6	2	8	3	4
Arrival time	2	5	1	0	4

(10 Marks)

b. What do you mean by CPU scheduling? Explain the scheduling criteria of Algorithm. **(10 Marks)**

3 a. Write and explain Bankers Algorithm for deadlock avoidance. **(10 Marks)**

b. With a neat diagram, explain Resource allocation graph. **(10 Marks)**

4 a. Explain the difference between internal and external fragmentation. **(10 Marks)**

b. What is page fault? What action does the operating system take when a page fault occurs? Explain with the diagram. **(10 Marks)**

5 a. Explain UNIX file system with a neat diagram. **(10 Marks)**

b. What is the use of ls command? In detail explain the output of ls-l. **(10 Marks)**

6 a. Explain the relative and absolute permission with examples. **(10 Marks)**

b. Describe hard links and softlinks with suitable examples. **(10 Marks)**

7 a. Explain the process in UNIX and mechanism of process creation. **(10 Marks)**

b. State the difference between internal and external commands in UNIX. **(10 Marks)**

8 a. Explain the use of set, set-x, test and IJ with example. **(10 Marks)**

b. Explain : i) If conditional statement, case statement
ii) While and for looping with examples **(10 Marks)**

9 a. What is AWK? Explain the built-in variable and built-in function used by AWK. **(10 Marks)**

b. Write an AWK script to compute gross salary of an employee accordingly to rule given below.
If a basic salary is < 10,000 then
HRG = 15% of basic 2 DA = 45% of basic
If basic salary is >= 10,000 then HRA = 20% of basic 2, DA = 50% of basic. **(10 Marks)**

10 a. Explain the following : i) Exec ii) export iii) eval. **(10 Marks)**

b. Write an awk program the folds long lines into 40 columns. **(10 Marks)**

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OR

6 a. Explain the UNIX file system with a neat diagram. (10 Marks)
b. Write differences between absolute pathname and relative pathname along with necessary examples. (10 Marks)

Module-4

7 a. Write a shell script to count the number of uppercase, small case, digit or special symbol using case conditional statement by taking input string. (10 Marks)
b. What is a process? Explain the mechanism of process creation and states of a process. (10 Marks)

OR

8 a. Write short notes on :
(i) at (ii) batch (iii) crm (iv) test (v) expr (10 Marks)
b. Write a shell script to display the calendar for current month with current date replaced by * or ** depending on whether the date has one digit or two digits. (10 Marks)

Module-5

9 a. Write short notes on :
(i) export (ii) eval (iii) exec (10 Marks)
b. Write an awk script to delete duplicate line from text.file. The order of original lines must remain unchanged. (10 Marks)

OR

10 a. What is awk? Explain the built-in variables used by awk. (10 Marks)
b. Explain the associative array in awk with an example. Also explain environment array. (10 Marks)

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CBCS SCHEME

USN | | | | | | | | | | |

20MCA12

First Semester MCA Degree Examination, Jan./Feb. 2021
Operating System with Unix

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What are the various services of an operating system? Explain briefly. **(10 Marks)**

b. Define process. Explain the five state process model with a neat diagram. **(10 Marks)**

OR

2 a. Calculate the average waiting time, turn around time for (i) SJF (ii) Priority scheduling and (iii) Round Robin [quantum = 2 ms] with the following set of processes.

Process	P_1	P_2	P_3	P_4	P_5
Burst time	10	1	2	1	5
Priority	3	1	3	4	5

(15 Marks)

b. Define System call. Classify the types of system calls. **(05 Marks)**

Module-2

3 a. What is demand paging? Explain how TLB improves the performance of demand paging with neat diagram. **(10 Marks)**

b. Consider following page reference string :
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1.
How many page fault would occur in the case (i) FIFO (ii) Optimal page replacement (iii) LRU. Assume there are 3 frames. **(10 Marks)**

OR

4 a. Consider the following snapshot of a system

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm.

(i) What is the content of the matrix need? **(07 Marks)**

(ii) If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately? **(08 Marks)**

b. What is deadlock? What are the necessary conditions for a deadlock to occur? **(05 Marks)**

Module-3

5 a. Differentiate hard link with soft link. **(10 Marks)**

b. Explain the following in detail with example:
(i) chmod (ii) ls (iii) mkdir (iv) chgrp **(04 Marks)**

c. Discuss the different modes of Vi editor. **(06 Marks)**