

Roll No.

BCA-C-401

B. C. A. (Fourth Semester) EXAMINATION, 2022-23

OPERATING SYSTEM AND LINUX

Time : 2 $\frac{1}{2}$ Hours

Maximum Marks : 60

Note : Attempt all questions.

Section—A

1. Multiple choice questions : 1 each

- (i) Race condition _____. (CO 1, BL-1)
- (i) result when several threads try to access the same data concurrently
- (ii) result when several threads try to access and modify the same data concurrently
- (iii) will result only if the outcome of execution does not depend on the order in which instructions are executed
- (iv) None of the above

(b) The init process which always has pid of :

(CO1, BL1)

- (i) 0
- (ii) 1
- (iii) 2
- (iv) 3

(c) is the concept in which a process copied into main memory from the secondary memory according to the requirement.

(CO2, BL1)

- (i) Paging
- (ii) Demand paging
- (iii) Segmentation
- (iv) Swapping

(d) Pre-emptive scheduling, is the strategy of temporarily suspending a running process :

(CO3, BL1)

- (i) Before the CPU time slice expires
- (ii) To allow starving processes to run
- (iii) When it requests I/O
- (iv) None of the above

(e) In FIFO page replacement algorithm, when a page must be replaced : (CO4, BL4)

- (i) oldest page is chosen
- (ii) newest page is chosen
- (iii) random page is chosen
- (iv) None of the mentioned

(f) In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to :

(CO1, BL4)

- (i) Suspended list
- (ii) Terminated state
- (iii) Ready state
- (iv) Blocked state

(g) A system is in the safe state if

(CO2, BL2)

- (i) the system can allocate resources to each process in some order and still avoid a deadlock
- (ii) there exists a safe sequence
- (iii) All of the mentioned
- (iv) None of the mentioned

(h) The segment of code in which the process may change common variables, update tables, write into files is known as : (CO2, BL3)

- (i) program
- (ii) critical section
- (iii) non-critical section
- (iv) synchronizing

- (i) Using which of the following command can hidden files be viewed : (CO5, BL5)
- (i) ls-h
 - (ii) ls-a
 - (iii) ls-i
 - (iv) ls-k
- (j) Which of the following commands is used to display and create files ? (CO1, BL5)
- (i) cat
 - (ii) lynx
 - (i) ed
 - (ii) vi
- (k) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called : (CO4, BL2)
- (i) fragmentation
 - (ii) paging
 - (iii) mapping
 - (iv) None of the mentioned
- (l) Process information in the current shell can be obtained by using : (CO5, BL3)
- (i) kill
 - (ii) bg
 - (iii) fg
 - (iv) ps

2. Attempt any *four* questions : 3 each
- (a) What are the main objectives of operating system ? Explain. (CO3, BL2)
 - (b) Describe the ways of implementing semaphores. (CO3, BL2)
 - (c) Write a short note on PCB. (CO4, BL-1)
 - (d) Explain Reader and writer problem. (CO2, BL-6)
 - (e) Write a short note on critical section. (CO3, BL6)

Section-B

3. Attempt only *two* of the following : 6 each
- (a) What is a filter ? Illustrate all filters with appropriate examples (CO5, BL3)
 - (b) Explain Banker Algorithm. (CO5 , BL4)
 - (c) Explain the purpose and importance of system calls in detail with examples. (CO5, BL4)
4. Attempt only *two* of the following : 6 each
- (a) Write a shell script to accept a filename. Check if the file exists and display the number of lines, words, and characters in the file. Display an appropriate message if the file is not present. (CO5, BL6)

- (b) How does deadlock avoidance differ from deadlock prevention ? Write about deadlock avoidance algorithm in detail. (CO4, BL2)
- (c) Consider the following set of processes, with the length of the CPU burst time given in milliseconds. The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0. (CO3, BL5)

Process	Burst Time	Priority
P1	2	2
P2	1	1
P3	8	4
P4	4	3
P5	5	3

Draw Gantt charts that illustrate the execution of these processes using the SJF scheduling algorithm. Calculate the average waiting and average turnaround time.

5. Attempt only *two* of the following : 6 each
- (a) Explain paging concept in Operating Systems. (CO4, BL2)

- (b) What is disk scheduling ? Explain the different types of disk scheduling by giving an example.
(CO4 , BL2)
- (c) Differentiate Preemption and Non-Preemption with an example ?
(CO3, BL4)