

Roll No.

BCA–C401

Bachelor of Computer Applications

(Fourth Semester)

EXAMINATION, 2023-24

OPERATING SYSTEM AND LINUX

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

Maximum Marks : 60

Note : All questions have to attempted.

Section—A

1. Multiple Choice Questions : 1 each

(a) Do and the done keyword is used by which loop statements ? (CO5, BL-2)

(i) For

(ii) While

(iii) For and While

(iv) Case

(v) None of the above

P. T. O.

(b) Thread is not shared among which of the following ? (CO2, BL-1)

- (i) Stack
- (ii) Program counter
- (iii) Both (i) and (ii)
- (iv) None of the above

(c) Identify the system call that on termination does not return control to the calling point :

(CO1, BL-2)

- (i) exec
- (ii) fork
- (iii) longjmp
- (iv) ioctl

(d) A computer with a 32-bit wide data bus uses $4K \times 8$ static RAM memory chips. What is the smallest memory that this computer can have ?

(CO3, BL-3)

- (i) 32 Kb
- (ii) 16 Kb
- (iii) 24 Kb
- (iv) 8 K

(e) What is compaction refer to ? (CO4, BL-2)

(i) A technique for overcoming internal fragmentation

(ii) A paging technique

(iii) A technique for overcoming external fragmentation.

(iv) A technique for compressing the data

(f) Which of the following are *two* types of atomic operations performed by semaphores ?

(CO2, BL-3)

(i) wait, signal

(ii) wait, stop

(iii) signal, stop

(iv) signal, wait

(g) Which of the following commands will allow the user to search contents of a file for a particular pattern ? (CO5, BL-1)

(i) touch

(ii) grep

(iii) find

(iv) is

- (h) Which of the type of OS reads and reacts in terms of actual time ? (CO1, BL-2)
- (i) Batch system
 - (ii) Quick response system
 - (iii) Real time system
 - (iv) Time sharing system
- (i) When does page fault occur ? (CO3, BL-4)
- (i) The page is present in memory
 - (ii) The deadlock occurs
 - (iii) The page does not present in memory
 - (iv) The buffering occurs
- (j) Reliability of Files can be enhanced by :
- (i) by keeping duplicate copies of the fields
 - (ii) making a different partition for the files
 - (iii) by keeping them in external storage
 - (iv) Keeping the files safely in the memory
- (k) The address generated by the CPU is : (CO3, BL-1)
- (i) Absolute address
 - (ii) Logical address
 - (iii) Physical address
 - (iv) Mac address

- (l) The most optimal CPU scheduling algorithm is :
(CO2, BL-1)
- (i) Shortest job first
 - (ii) First come first serve
 - (iii) Round robin
 - (iv) None of the above
2. Attempt any *four* of the following : 3 each
- (a) Define Process. Explain various steps involved in change of a process state with neat transition diagram. (CO2, BL-1)
 - (b) Difference between External and Internal Fragmentation. (CO4, BL-4)
 - (c) What is a safe state and unsafe state. (CO2, BL-1)
 - (d) Describe the operating system functions.
(CO1, BL-2)
 - (e) Design, Develop and implement a shell script to perform the following string operation :
(CO5, BL-6)
 - (i) To extract a substring from a given string
 - (ii) To find the length of a given string.

Section—B

3. Attempt any *two* of the following : 6 each
- (a) Explain Paging with example. Differentiate paging and segmentation. (CO3, BL-4)

- (b) Consider the following Process : (CO2, BL-6)

Process	Arrival Time	Burst Time (ms)
P ₁	0	8
P ₂	1	4
P ₃	2	9
P ₄	3	5

What is the average waiting and turnaround time for these process with ?

- (i) FCFS scheduling
 - (ii) Preemptive SJF Scheduling
- (c) What are files and explain the access method for files ? (CO4, BL-3)
4. Attempt any *two* of the following : 6 each
- (a) What is Kernel ? Describe various operations performed by Kernel. (CO1, BL-2)
 - (b) Describe Banker's algorithm for safe allocation. (CO2, BL-3)
 - (c) Define SCAN and C-SCAN scheduling algorithm. (CO4, BL-1)
5. Attempt any *two* of the following : 6 each
- (a) Illustrate the following page-replacement algorithms. (CO3, BL-3)
 - (i) FIFO
 - (ii) Optimal Page Replacement

Use the reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1, for a memory with three frames

- (b) Explain the various conditional statements in shell script along with example. (CO5, BL-3)
- (c) Explain the following terms in detail :
(CO1, BL-2)
 - (i) Multiprocessor operating system
 - (ii) Time sharing system
 - (iii) Real time system