Total No. of printed pages = 4

BCA 171501

Roll No. of candidate | | | | | | | | | | |

2/3/21

2021

B.C.A 5th Semester End-Term Examination

OPERATING SYSTEM

(New Regulation)

Full Marks – 70 Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Fill in the blanks, (10 × 1 = 10)

(i) _____ operating system does not support more than one program at a time.

(a) LINUX

(b) MS Windows

(c) UNIX

(d) MS DOS

(ii) _____ is not a state of process.

(a) New

(b) Old

(c) Waiting

(d) Running

(iii) _____ is called a program In execution.

(a) process

(b) method

(c) function

(d) instruction

[Turn over

(iv) ———————— scheduler is also celled a job scheduler.

(a) Short term scheduler

(b) Medium term scheduler

(c) Long term scheduler

(d) Very short term scheduler

(v) In ———————— a process is executing in its critical section, then no other processes can be executing in their critical Section.

(a) progress

(b) mutual exclusion

(c) asynchronous execution

(d) synchronous execution

(vi) A process is represented in the operating system by a ————————

(a) process control block

(b) printed circuit board

(c) problem control block

(d) program condition block

(vii) A program may call other programs during its execution, say functions from other libraries, this called ————————

(a) compiling

(b) executing

(c) linking

(d) loading

(viii) The bounded buffer problem Is also known as ————————

(a) reader's writer's problem

(b) producer-consumer problem

(c) dining philosopher's problem

(d) dinning reader's problem

(ix) While executing a program, if the program references a page which is not available in the main memory is commonly known as ————————

(a) page fault

(b) frame fault

(c) processor fault

(d) memory fault

(x) A semaphore is a/an ———————— to solve the critical section problem.

(a) hardware

(b) system program

(c) integer variable

(d) application software

2. (a) What is a short time scheduler? What is the purpose of using a ready queue? (4)

(b) Consider the following CPU Burst time for the processes P_1, P_2 and P_3. (6)

Process	Burst Time (millisecond)
P1	15
P2	6
P3	3

Find the average waiting time of the processes in FCFS and SJF scheduling.

(c) Show with a diagram how a process moves from one queue to another. (5)

3. (a) What do you mean by context switching? Context switching time should be big or small. Explain. (4)

(b) What is a PCB in operating system? What are the different contents of a PCB? (4)

(c) Explain the different states of a process with a block diagram. (4)

(d) What is cascading termination of a processes? What is a zombie process? (3)

4. (a) What is a mutex lock? How it can be acquired and released? (5)

(b) What is a critical section? What are the necessary requirements for the solution to the critical section problem? (6)

(c) What is a race condition? (4)

5. (a) What do you mean by a logical address and a physical address? (4)

(b) What is first-fit, best-fit, and worst-fit strategies of memory allocation? (6)

(c) What are the contents of a page table? Why the size of a page is a power of 2? What is segmentation? (5)

6. (a) What do you mean by swap-in and swap-out in memory management? Why mobile operating systems such as IOS and Android do not support swapping? (4)

(b) What do you mean by demand paging? What is a page fault? (3)

(c) Consider the following page reference string: (8)

7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1.

Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms?

(i) LRU replacement

(ii) FIFO replacement

7. (a) What is a Dining Philosopher's problem? (4)

(b) What do you mean by internal fragmentation and external fragmentation? (4)

(c) What are the two functions through which a semaphore is modified? (2)

(d) How a process is created in LINUX operating system? Explain. (5)