

Roll No.

Total No. of Pages : 03

Total No. of Questions : 07

BCA (Sem-4)
OPERATING SYSTEMS

Subject Code : UGCA-1923

M.Code : 79727

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SIX** questions carrying **TEN** marks each and students have to attempt any **FOUR** questions.

SECTION-A

1. Write Briefly :

- List and explain the functions and services of an operating system.
- Defend timesharing differ from multiprogramming?
- Explain process states with state transition diagram. Also explain PCB with a neat diagram.
- What are the uses of job queues, ready queues and device queues?
- Discuss the difference between symmetric and asymmetric multiprocessing
- Distinguish between hard real time systems and soft real time systems.
- Can traps be generated intentionally by a user program? If so, for what purpose?
- What are the five major activities of an operating system with regard to process management?
- What are the three major activities of an operating system with regard to memory management?
- What is distributed operating system? Explain its characteristics and architecture.

SECTION-B

2. Consider the following set of process arrival time and burst time, larger priority number has a higher priority.

Jobs	Arrival Time ms	Burst Time ms	Priority
J1	0	6	4
J2	3	5	2
J3	3	3	6
J4	5	5	3

Draw the Gantt chart circulate waiting time and turnaround time using :

- a) FCFS
 - b) Preemptive priority scheduling algorithm.
3. Consider the methods used by processes P1 and P2 for accessing their critical sections whenever needed, as given below. The initial values of shared Boolean variables S1 and S2 are randomly assigned.

Method used by P ₁	Method used by P ₂
While ($S_1 = S_2$); Critical Section $S_1 = S_2$	While ($S_1 \neq S_2$); Critical Section $S_2 = !S_1$

Explain by taking different values of S_1 and S_2 that above mentioned properties are represented by mutual exclusion and not progress.

4. Consider a reference string: 4,7,6, 1, 7, 6, 1,2, 7, 2. The number of frames in the memory is 3. Find out the number of page faults respective to:
- a) Optimal Page Replacement Algorithm
 - b) FIFO Page Replacement Algorithm
 - c) LRU Page Replacement Algorithm.
5. A certain computer system has the segmented paging architecture for virtual memory. The memory is byte addressable. Both virtual and physical address spaces contain 216 bytes each. The virtual address space is divided into 8 non-overlapping equal size segments. The Memory Management Unit (MMU) has a hardware segment table, each entry of which contains the physical address of the page table for the segment. Page tables are stored in the main memory and consists of 2 byte page table entries. What is the minimum page size in bytes so that the page table for a segment requires at most one page to store it?

6. What is Remote File System (RFS) in File Management? Explain Client-Server Model in RFS. What is the maximum length of the filename in DOS? Name operating system that does not support more than one program at a time.
7. Define a Distributed System. Mention a few real time examples of distributed systems. What are the models that are followed in distributed systems? List the characteristics of a distributed system. Mention the advantages of a distributed computing environment over standalone applications. What is the security mechanisms used in distributed computing?

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.