Roll No. (illegible)

Total No. of Questions : 07

Total No. of Pages : 03

BCA (Sem–4)

OPERATING SYSTEMS

Subject Code : UGCA-1923

M.Code : 79727

Time : 3 Hrs.

Date of Examination : 02-06-2023

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 :

a. List and explain the functions and services of an operating system.

b. Defend timesharing differ from multiprogramming?

c. Explain process states with state transition diagram. Also explain PCB with a neat diagram.

d. What are the uses of job queues, ready queues and device queues?

e. Discuss the difference between symmetric and asymmetric multiprocessing

f. Distinguish between hard real time systems and soft real time systems.

g. Can traps be generated intentionally by a user program? If so, for what purpose?

h. What are the five major activities of an operating system with regard to process management?

i. What are the three major activities of an operating system with regard to memory management?

j. 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 != S_2); Critical Section S_2= ! S_1

Explain by taking different values of S_1 and S_2 that above [illegible] 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?