BCA [Honours]
[CBCS]
B.Sc. Third Semester End Examination-2023
(Regular & Supplementary Paper)
PAPER-C6T
Operating system

Full Marks: 40　　　　　　　　**Time: 02 Hrs**

The figures in the right hand margin indicate marks
Candidates are required to give their answers in their own words as far as practicable
Illustrate the answers wherever necessary

Group A

1) Answer any FIVE questions of the following:　　**5x2= 10**

i)   What is binary semaphore?

ii) What is Belady's anamoly?

iii) What is seek time?

iv) What do you mean by thrashing?

v)   What is the role of page table?

vi) Differentiate between function call and system call.

vii) What are the benefits of thread pool

viii) What is demand paging?

Group B

Answer any FOUR questions of the following: 4x5 = 20

2) Processor A and b uses FCFS and SJF CPU scheduling algorithm respectively. Compute average waiting time and average turn around time of the following processes for processor A and B.

Process	Arrival Time	Execution Time
I	1	5
II	5	4
III	5	2
IV	8	6

3) Consider the list of processes and their memory requirements.

Process	Memory Size
I	1KB
II	4KB
III	3KB

Show the memory allocation of the above processes using first-fit and best-fit memory allocation strategies for the following available memory blocks. Calculate the resultant external and internal fragmentation for these two memory allocation strategies.   3+2

8KB
5KB
1KB
2KB
1KB

4) Consider the following sequence of pages of a process referred by CPU with the three available memory frames: 1, 4, 2, 1, 2, 3, 1, 2, 3, 3, 4. Show the frame allocations using LRU algorithm, Find the number of page faults.   3+2

5) What is process control block (PCB)? What is the file allocation table (FAT)?   3+2

6) The following two functions P1 and P2 that share a variable B with an initial value of 2 execute concurrently.

```
P1( ) {                      P2( ) {
    C=B-1;                       D=2*B;
    B=2*C;                       B=D-1;
}                            }
```

Find out the number of distinct values that B can possibly take after the execution and show the values of B.

7) In a simple paging system, with 224 bytes of logical memory, 256 pages at physical Address space and a page size 210 bytes, How many bits are there in physical address?

Group C

Answer any ONE question of the following: 1x10 = 10

8) a. Write the banker's algorithm and explain it's use with an example.   3+4

b. Discuss one strategy employed by operating system for user authentication.   3

9) Consider the following snapshot of a system with five processes and four resource types:

| Process | Allocation | | | | Max | | | | Available | | | |

Process	X	Y	Z	W	X	Y	Z	W	X	Y	Z	W
P_1	0	0	1	2	0	0	1	2	2	1	0	0
P_2	2	0	0	0	2	7	5	0				
P_3	0	0	3	4	6	6	5	6				
P_4	2	3	5	4	4	3	5	6				
P_5	0	3	3	2	0	6	5	2				

i)   Write down the content of 'Need' matrix.

ii)   Check whether the system is in safe state or not .

iii)   If a request from P3 arrives for (0, 1, 0, 0), show whether the request can be granted immediately or not.   2+3+5