5E1753

Total No. of Questions : 22 Total No. of Pages : 04

Roll No. : .....

# 5E1753

## B.Tech. V-Sem. ( Main/Back ) Exam. - 2024

### Operating System

### 5AID4-03 Operating System

### CS,IT,AID,CAI,CDS,CIT,CCS

Time : 3 Hours Maximum Marks : 70

*Instructions to Candidates :*

**Attempt all ten questions from Part-A, five questions out of seven questions from Part-B and three questions out of five questions from Part-C.**

*Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

*(Mentioned in Form No. 205)*

1. .....  2. .....

**PART-A** [10x2=20]

**(Answer should be given up to 25 words only)**

**All questions are compulsory**

Q.1. What is Kernel?

Q.2. What do you mean by system call?

Q.3. What is process control block?

Q.4. Define effective access time?

Q.5. Name any five page replacement algorithm used for page replacement.

Q.6. What are the various file operations?

Q.7. What are safe and unsafe state in a deadlock?

Q. 8 Define deadlock prevention.

Q. 9 What is the main function of Memory Management Unit (MMU)?

Q. 10. What is the importance of Disc scheduling in operating system?

## PART-B

[5x4=20]

### (Analytical/Problem Solving Questions)

### Attempt any five questions

Q.1. Differentiate among multi programming, multi-processing and multi-tasking.

Q.2 State the differences between logical and physical address space.

Q.3. What do you mean by a Deadlock? Explain Banker's algorithm with an example.

Q.4. What is Directory? What are UFD and MFD? Also state the operations that can be performed on a directory.

Q 5. What is a race condition? Illustrate with an example why presence of race condition is considered as bad design.

Q.6. Consider there are three page frames which are initially empty. If the page reference string is 1, 2, 3, 4, 2, 1, 5, 3, 2, 4, 6. Calculate the number of page faults using the optimal page replacement policy.

Q.7. Explain the performance of demand paging with necessary examples.

## PART-C

[3x10=30]

**(Descriptive/Analytical/Problem Solving/Design Question)**

**Attempt any three questions.**

Q1. (a) Describe the actions taken by Kernel to context switch between processes.

(b) For a given set of processes calculate the average wait time and average turn around time by using FCFS, SJF and RR.

| Process | Burst | Priority |
|---|---|---|
| P1 | 8 | 4 |
| P2 | 6 | 1 |
| P3 | 1 | 2 |
| P4 | 9 | 2 |
| P5 | 3 | 3 |

Q.2 What is Fork system call? What will be the output of the following code and justify the output?

```
#include<stdio.h>
#include<unistd.h>
 int main ()
      { if (fork () : : fork ())
           fork () ;
       Printf("1") ;
        return 0 ;
      }
```

Q.3 Suppose that a disk has 500 cylinders, (0-4999). The drive is currently serving a request at 143, and the previous request was at cylinder 125. The queue of pending requests are 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from the current head position, what is the total distance that the disk arm move to satisfy all the pending requests for each of the following :

(i) FCFS

(ii) SSTF

(iii) SCAN

Q.4. (a) What is Virtual Memory? How it is different from Cache memory and secondary memory? Also discuss the benefits of virtual memory techniques. [6]

(b) Discuss the indexed file allocation method with proper example. [4]

Q. 5. Write short notes on the following : [2.5×4=10]

(a) Mobile OS

(b) Time OS

(c) Belady Anomaly

(d) Principle of locality of reference

----- x -----