

# School of Computing Science and Engineering

B.Tech CSE  
ETE - Jun 2023

Time : 3 Hours

Marks : 100

## Sem IV - E2UC401B/BTCS2400

### Operating System

*Your answer should be specific to the question asked*

*Draw neat labeled diagrams wherever necessary*

1. Express the context switching with a diagram. K3 CO3 (5)
2. Describe the Process. Give the difference between Process and programme. K2 CO2 (5)
3. Identify the features of the Real-Time Operating System. K1 CO1 (5)
- 4) Consider the below-mentioned page-reference string: assuming the frame size to be 4, also assume that the frames are initially empty.  
1,2,3,4,2,1,5,6,4, 7, 6, 1, 7, 6, 1, 2, 7, 2  
Calculate the page faults and Page hits that would occur for the following replacement algorithms.  
a) Least Recently Used  
b) First in First Out K4 CO4 (10)

### OR

- Categories the File Directories and their operation types. K4 CO4 (10)
5. Define System Components. explains all the components in detail. K1 CO1 (10)
  6. Explain Process Control Block (PCB). K2 CO2 (10)
  7. 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:  
1. Optimal Page Replacement Algorithm  
2. LRU Page Replacement Algorithm  
Which algorithm is better, according to you? K4 CO4 (10)
  - 8) According to the FIFO page replacement policy, for an arbitrary page access pattern, increasing the number of frames in the main memory will result in increasing the page faults or will reduce them. Justify your answer with an example. K4 CO4 (15)

### OR

- Consider a disk with 200 tracks and the queue has random requests from different processes in the order:  
55, 58, 39, 18, 90, 160, 150, 38, 184  
Initially arm is at 100. Find the Average Seek length using FCFS, SSTF, C-SCAN and LOOK algorithm. K4 CO4 (15)
9. Illustrate the following. K3 CO3 (15)  
(a) Mutual-exclusion implementation with test and set() instruction.  
(b) Critical Section problem. Illustrate the software-based solution to the Critical Section problem.
  10. Given references to the following pages by program: K3 CO3 (15)  
0,1,4,2,0,2,6,5,1,2,3,2,1,2,6,2,1,3,6,2  
how many page faults will occur if the program has three-page frames available to it and uses:  
a) FIFO replacement  
b) LRU replacement