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**Presidency University**

**Bengaluru**

**School Of Computer Science and Engineering & Information Science**

**SUMMER End-Term Examinations, Aug 2024**

**Date**: 08.08.2024

**Time**: 9.30 AM- 12.30 PM

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSE2010

**Course Name**: Operating Systems

**Department:** CSE

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** |
| 1 | 1. What is Operating Systems in view of user and system? Explain. | 4 | CO1 | L1 |
| 1. Explain the dual mode operation of Operating Systems with a neat diagram. | 6 | CO1 | L2 |
| 1. What are System calls? Explain the different types. | 10 | CO1 | L3 |
| OR | | | | |
| 2 | 1. Explain System programs with appropriate example. | 4 | CO1 | L1 |
| 1. List and explain the design goals of Operating Systems. | 6 | CO1 | L2 |
| 1. Describe the Architecture of a traditional Linux operating system with a neat diagram. | 10 | CO1 | L3 |

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| 3 | 1. What is Process Control Block? Explain are information maintained in it. | 4 | CO2 | L1 |
| 1. Describe Context Switch in Operating Systems with a neat diagram | 6 | CO2 | L2 |
| 1. For blow processes compute the average waiting time throughput using Round Robin (time quantum=2 MS), FCFS, SJF scheduling algorithms  |  |  |  | | --- | --- | --- | | Process | Arrival Time | Burst Time | | P0 | 0 | 9 | | P1 | 0 | 5 | | P3 | 2 | 6 | | P4 | 3 | 7 | | 10 | CO2 | L3 |

OR

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| 4 | 1. Define Process. Explain the different states of a process with a neat diagram. | 4 | CO2 | L1 |
| 1. Describe the implementation of Inter process Communication using shared memory. | 6 | CO2 | L2 |
| 1. Calculate Average Waiting Time and Average Turnaround time for the given system scenario if it follows SRTF algorithms.  |  |  |  | | --- | --- | --- | | Process | Arrival Time(in MS) | Burst Time(in MS) | | P1 | 0 | 21 | | P2 | 1 | 6 | | P3 | 2 | 2 | | P4 | 0 | 1 | | P5 | 3 | 5 | | 10 | CO2 | L3 |

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| 5 | 1. What are cooperative and Concurrent Processes? Explain with example | 4 | CO3 | L1 |
| 1. Define Critical Section (CS)? Discuss about the necessary conditions satisfied by CS solutions. | 6 | CO3 | L2 |
| 1. What is Dining philosopher problem? Explain the algorithm with detail steps. | 10 | CO3 | L3 |

OR

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| 6 | 1. What is Deadlock? Explain the necessary conditions for Deadlock. | 4 | CO3 | L1 |
| 1. Describe the steps involved in deadlock recovery in brief. | 6 | CO3 | L2 |
| 1. Determine whether the following system is safe using Banker's Algorithm. If the request form P1 arrives for (1 0 2) can be granted immediately or not.  |  |  |  |  | | --- | --- | --- | --- | | Process | Allocation  A B C | Max  A B C | Available  A B C | | P0 | 0 1 0 | 7 5 3 | 3 3 2 | | P1 | 2 0 0 | 3 2 2 |  | | P2 | 3 0 2 | 9 0 2 | | P3 | 2 1 1 | 2 2 2 | | 10 | CO3 | L3 |

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| 7 | 1. Differentiate between physical and Logical address spaces. | 4 | CO4 | L1 |
| 1. With the help of a neat diagram, explain the various steps of address binding. | 6 | CO4 | L2 |
| 1. Consider the page reference string: 1,0,7,1,0,2,1,2,3,0,3,2,4,0,3,6,2,1 for a memory with three frames. Determine the number of page faults using the FIFO, Optimal, and LRU replacement algorithms. Which algorithm is most efficient? | 10 | CO4 | L3 |

OR

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| 8 | 1. Why user view of memory is not supported by Paging? Justify. | 4 | CO4 | L1 |
| 1. What is demand paging? Explain the steps in handling page faults using the appropriate diagram. | 6 | CO4 | L2 |
| 1. What is segmentation? Explain the basic method of segmentation with an example. | 10 | CO4 | L3 |

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| 9 | 1. What are the design goals of Operating Systems explain any two. | 4 | CO1 | L1 |
| |  | | --- | | 1. Recognise different technologies in the different generations of OS. | | 6 | CO1 | L2 |
| 1. Discuss in detail about the operating system structure of MS DOS, UNIX, layered and Microkernel with neat diagrams. | 10 | CO1 | L3 |

OR

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| 10 | 1. What are threads? Explain the different threading models. | 4 | CO2 | L1 |
| 1. Explain briefly the different threading issues. | 6 | CO2 | L2 |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 1. Calculate Average Waiting Time, Average Turnaround time for the given system scenario if it follows SJF algorithms.  |  |  |  | | --- | --- | --- | | Process | AT(ms) | BT(ms) | | P1 | 0 | 12 | | P2 | 2 | 7 | | P3 | 2 | 5 | | P4 | 3 | 2 | | P5 | 4 | 3 | | | 10 | CO2 | L3 |