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**Presidency University**

**Bengaluru**

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

**Summer term 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**: CSE3120

**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 the 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) and FCF 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. Write a program to demonstrate to creating a new process and waiting for a process | 4 | CO3 | L1 |
| 1. Write a bankers algorithm for deadlock avoidance | 6 | CO3 | L2 |
| C:\Users\Admin\Downloads\WhatsApp Image 2021-12-27 at 10.46.05.jpeg  Above RAG depicts the current situation in a system. [10]   1. Mention the number of request edges and allocation edges. [2] 2. Mention the different resources types and their instances. [2] 3. Mention the number of cycles. [2] 4. Find out whether a deadlock exists or not. If yes, mention the number and names of the processes involved in the deadlock. If no, justify the answer. [4] | 10 | CO3 | L3 |

OR

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| 8 | Answer the following questions using the banker’s algorithm:   1. What is the content of the matrix Need? [6]   C:\Users\Admin\Desktop\Capture.JPG | 4 | CO3 | L1 |
| 1. Is the system in a safe state? [3] | 6 | CO3 | L2 |
| 1. If a request from thread T1 arrives for (0,4,2,0), can the request be granted immediately? | 10 | CO3 | 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 preemptive algorithms.  |  |  |  | | --- | --- | --- | | Process | AT(ms) | BT(ms) | | P1 | 0 | 12 | | P2 | 2 | 7 | | P3 | 2 | 5 | | P4 | 3 | 2 | | P5 | 4 | 3 | | | 10 | CO2 | L3 |