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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKE-UP EXAMINATION JULY 2024

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| **Semester :4th** | **Date :12/07/2024** |
| **Course Code: CSA1006** | **Time: 1.30 pm to 4.30 pm** |
| **Course Name: Operating Systems and Unix Programming** | **Max Marks :100** |
| **Program: B.C.A** | **Weightage: 50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 4 QUESTIONS 4Q X 5M=20M** | | | |
| 1 | Differentiate between shared memory and message passing. | (CO 2) | [UNDERSTAND] |
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| 2 | Explain any four-file operation. | (CO 4) | [APPLY] |
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| 3 | Elaborate the process control block with a block diagram. | (CO 1) | [REMEMBER] |
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| 4 | Define and Explain Virtual Memory. | (CO 3) | [UNDERSTAND] |
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| 5 | Explain the concept of Context Switching with a suitable diagram? | (CO 2) | [UNDERSTAND] |
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| 6 | Write the difference between Preemptive and Non-preemptive scheduling. | (CO 4) | [APPLY] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 7 | Explain the main services provided by Operating system to the user. | (CO 1) | [REMEMBER] |
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| 8 | Define Paging. Draw a neat diagram to show the steps required to handle a page fault in demand paging. | (CO 4) | [APPLY] |
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| 9 | Define Starvation in deadlock. Explain the conditions necessary for a deadlock situation to arise. | (CO 2) | [UNDERSTAND] |
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| 10 | Suppose that the processes arrive in the order P1, P2, P3, P4 and P5 at time 0. Draw the Gantt chart and find average waiting time, average turnaround time and throughput using FCFS scheduling Algorithm. | (CO 1) | [REMEMBER] |
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| 11 | Show how address binding is done in memory management with the help of a neat diagram. | (CO 3) | [UNDERSTAND] |
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| 12 | Elaborate on different process states with a neat diagram. | (CO 1) | [REMEMBER] |
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| 13 | Explain the LINUX architecture with a neat diagram. | (CO 2) | [REMEMBER] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 15M=30M** | | | |
| 14 | Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 Identify the number of page faults and page hits would occur using FIFO and Optimal page replacement algorithms, assuming frames size as three? Calculate the page fault rate and page hit rate for the same. | (CO 4) | [APPLY] |
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| 15 | Consider the following snapshot of resource allocation for a system.   1. Generate at least one safe sequence to show that the system is in safe state. 2. A request from process P2 arrives for (0, 0, 2) can the request be granted immediately.   Justify whether the system is in safe state if the request is granted? | (CO 2) | [UNDERSTAND] |
|  | | | |
| 16 | 1. Write a Shell Program to find the roots of the quadratic equation. 2. ​​​​​​​Write a Shell program to swap the two integers. 3. Write a shell program to find the smallest digit of a value. 4. Write a shell script to perform integer arithmetic operations. | (CO 4) | [APPLY] |