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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JULY 2024

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| **Semester : III & IV** | **Date :01/07/2024** |
| **Course Code: CSE 3120** | **Time: 9.30 am to 12.30 pm** |
| **Course Name: Operating Systems with Linux Internals** | **Max Marks :100** |
| **Program: B.Tech** | **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 | Explain the role of Operating System with the help of component diagram. | (CO 1) | [UNDERSTAND] |
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| 2 | Define Threads. Explain various threading models? | (CO 3) | [APPLY] |
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| 3 | What is Process Synchronization? Explain with a neat example. | (CO 3) | [APPLY] |
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| 4 | List the various process scheduling algorithms. Explain turnaround time and throughput. | (CO 2) | [REMEMBER] |
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| 5 | Explain the concept of Context Switching with a suitable diagram? | (CO 1) | [UNDERSTAND] |
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| 6 | What are Monitors? Explain the schematic view of it and its conditional variables usage with a neat diagram. | (CO 3) | [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) | [UNDERSTAND] |
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| 8 | Define Process Control Block. Explain the contents of PCB? List the various process scheduling algorithms. | (CO 2) | [REMEMBER] |
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| 9 | Define Starvation in deadlock. Explain the conditions necessary for a deadlock situation to arise. | (CO 3) | [APPLY] |
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| 10 | Suppose that the processes arrive in the order P1,P2,P3,P4 and P5Find average waiting time, average turnaround time and throughput using FCFS scheduling Algorithm. | (CO 2) | [REMEMBER] |
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| 11 | Explain the LINUX architecture with a neat diagram. | (CO 1) | [UNDERSTAND] |
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| 12 | What is the Peterson’s solution? Explain in detail with the code. | (CO 3) | [APPLY] |
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| 13 | Write a C program to elaborate the concept of IPC using readers writers’ program as an example. | (CO 3) | [APPLY] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 15M=30M** | | | |
| 14 | List the classical problems of a synchronization. Explain Dining philosopher problem with the appropriate code. | (CO 3) | [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) | [REMEMBER] |
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| 16 | WAP to demonstrate synchronization using semaphore in c language with threads updated values | (CO 3) | [APPLY] |