**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **2BT3143** | Roll No. | Total Printed Pages: 2 |
| **2BT3143** |  |
| B. Tech. II Year III- Semester (Main/Back) End Semester Examination, November 2022  **(CS / AI&DS / CE / CC)** | |
| **BCECCE3104 : Operating System** | | | |

# Time: **3** Hours. Total Marks: **60**

Min. Passing Marks: **21**

*Attempt* ***five*** *questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.*

Use of following supporting material is permitted during examination for this subject.

# **1.--------------------------Nil--------------------** **2.------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | Differentiate between:   1. Time sharing and Multiprogramming operating system? 2. Batch and Real time operating system | **(6)** | **Analyze** |
|  |  |  |  |  |
|  | **(b)** | Discuss the Simple Operating System Structure. Describe the layered approach | **(6)** | **Understand** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | Define System Calls in the Operating System? Explain its types in detail? | **(6)** | **Remember** |
|  |  |  |  |  |
|  | **(b)** | Write short note on the following with suitable diagram:  (i) System Program (ii) Kernel (iii) Shell | **(6)** | **Understand** |
|  |  |  |  |  |
|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** | **(a)** | What is a process? Explain different process states? | **(6)** | **Remember** |
|  |  |  |  |  |
|  | **(b)** | Consider the following five processes, with the length of the CPU burst time given in milliseconds. Process Burst time P1 10 P2 29 P3 3 P4 7 P5 12 Consider the First come First serve (FCFS), Non Preemptive Shortest Job First(SJF), Round Robin(RR) (quantum/time slice=10) scheduling algorithms. Illustrate the scheduling using Gantt charts. | **(6)** | **Apply** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.4** | **(a)** | Describe process control block with proper diagram? | **(6)** | **Understand** |
|  |  |  |  |  |
|  | **(b)** | List the following:  (i) Race Condition (ii) Critical Section (iii) Lock Variable | **(6)** | **Remember** |
|  |  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |  |
|  |  |  |  |  |
| **Q.5** | **(a)** | Explain various methods for handling deadlock? | **(6)** | **Understand** |
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|  |  |  |  |  |
|  | **(b)** | Consider the following:    Answer the following questions using the Banker’s algorithm-  (i) What is the content of the need matrix?  (ii) Is the system in a safe state?  (iii) If a request from process P1 arrives for (0,4,2,0), can the request be granted immediately? | **(6)** |  |
|  |  |  |  |  |
|  |  | **OR** |  |  |
| **Q.6** | **(a)** | Write about Deadlock Prevention Methods? | **(6)** | **Remember** |
|  |  |  |  |  |
|  | **(b)** | Consider the resource allocation graph in the figure    Check if there is a deadlock or not. If there is no deadlock, find a safe sequence. | **(6)** | **Create** |
|  |  | **UNIT-IV (CO4)** |  |  |
|  |  |  |  |  |
| **Q.7** | **(a)** | a) Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementations of the LRU algorithm  b) Explain about Swapping. | **(4+2)** | **Apply** |
|  |  |  |  |  |
|  | **(b)** | Write short notes on:  a) Segmentation b) Paging c) Page replacement | **(6)** | **Remember** |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.8** | **(a)** | Illustrate the page-replacement algorithms i) FIFO ii) Optimal Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames. | **(6)** | **Apply** |
|  |  |  |  |  |
|  | **(b)** | Differentiate between following:   1. fixed and variable partition of contiguous memory allocation 2. internal and external fragmentation | **(6)** | **Analyze** |
|  |  | **UNIT V (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | Explain the concept of file with Example. | **(6)** | **Understand** |
|  |  |  |  |  |
|  | **(b)** | Define in detail all File Access Methods. | **(6)** | **Remember** |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** | **(a)** | Write in detail about various file allocation methods. | **(6)** | **Understand** |
|  |  |  |  |  |
|  | **(b)** | Distinguish between the following:   1. Single Level Directory and Two level Directory 2. Absolute and Relative Path Name | **(6)** | **Analyze** |