**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, April 2023**

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|  | **2BT4135** | Roll No. | Total Printed Pages: 2 |
| **2BT4135** |  |
| B. Tech. II Year IV- Semester (Back) End Semester Examination, April 2023 | |
| **BAI04101 / BCC04101 / BDS04101 : Operating System** | | | |

# Max. Time: **3** Hours. Max. 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.----------------------------------------------** **2. -----------------------------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | There are different structures of the Operating systems available to us. Define any two of them with the help of a suitable diagram for each. | **(6)** | **Understanding and evaluating** |
|  |  |  |  |  |
|  | **(b)** | The Operating system controls the different operations of the system with the help of different system calls. Explain the different types | **(6)** | **Understanding and remembering** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | What is the main advantage of an operating System designer of using virtual machine architecture? How it is beneficial for the user. Explain by taking a suitable example. | **(6)** | **Analyze and Apply** |
|  |  |  |  |  |
|  | **(b)** | What are the five major activities of an Operating System with regard to file management? Explain by taking a suitable real-life example. | **(6)** | **Analyze and Apply** |
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|  |  | **UNIT-II (CO2)** |  |  |
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| **Q.3** | **(a)** | Consider a system implementing multilevel queue scheduling. What strategy can a computer user can employ to maximise the amount of CPU time allocated to the user’s process? | **(6)** | **Analyze and Apply** |
|  |  |  |  |  |
|  | **(b)** | Why it is important for a scheduler to distinguish I/O bound programs from CPU bound programs? Explain with the help of a suitable example. | **(6)** | **understanding and evaluating** |
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|  |  | **OR** |  |  |
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| **Q.4** | **(a)** | Describe the difference between the different scheduling algorithms with an appropriate example for each. | **(6)** | **Analyzing and evaluating** |
|  |  |  |  |  |
|  | **(b)** | What are cooperating processes? Why do we need such processes? Explain any four suitable reasons by taking a suitable example. | **(6)** | **Analyzing and evaluating** |
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|  |  | **UNIT-III (CO3)** |  |  |
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| **Q.5** | **(a)** | What are semaphores? How they can assist and inhibit an approach to shared resources in a multiprogramming environment. Explain with the help of a suitable example. | **(6)** | **Analyze and evaluate** |
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|  | **(b)** | A system has 4 processes and 5 allocable resources. The current allocation and maximum needs are as follows-   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **Allocated** | | | | | **Maximum** | | | | | | **A** | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | | **B** | 2 | 0 | 1 | 1 | 0 | 2 | 2 | 2 | 1 | 0 | | **C** | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 1 | 1 | | **D** | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 0 |    1.Calculate the need matrix  2. Calculate the sequence of processes executed.  3. Let if Available = [0 0 X 1 1] what is the smallest value of x for which this is a safe state? | **(6)** | **Analyzing and apply** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** | **(a)** | Consider the deadlock situation that occurs in the dinning philosopher’s problem when the philosopher obtains the chopsticks one at a time. Explain the four necessary conditions which are satisfied here for the deadlock. Also, define how deadlock could be avoided in this case by eliminating one of those conditions. | **(6)** | **Analyze and Evaluate** |
|  |  |  |  |  |
|  | **(b)** | How could you solve the different classical problems of synchronization with the help of semaphores? Explain with the help of a suitable example | **(6)** | **Analyze and Evaluate** |
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|  |  | **UNIT-IV (CO4)** |  |  |
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| **Q.7** | **(a)** | Suppose I need to load a process into memory. From where do I need to pick it from? How swapping of this process could be done for maximizing the resource utilization. Explain with the help of a suitable example. | **(6)** | **Analyze and apply** |
|  |  |  |  |  |
|  | **(b)** | Why do we need to allocate memory to a process? Differentiate between compile time, load time and execution time memory with the help of a suitable example for each | **(6)** | **Analyze and apply** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.8** | **(a)** | Differentiate between the SCAN and C\_SCAN algorithms of disk scheduling with the help of a suitable example for each. | **(6)** | **Remembering and applying** |
|  |  |  |  |  |
|  | **(b)** | How does an indexed allocation different from the linked allocation of memory? Justify with the help of a suitable example | **(6)** | **Analyze and create** |
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|  |  | **UNIT V (CO5)** |  |  |
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| **Q.9** | **(a)** | How does a Hierarchical structure is maintained to organise the protection domain in a MULTICS system? Explain by a suitable diagram and example. | **(6)** | **Understanding and creating** |
|  |  |  |  |  |
|  | **(b)** | Define a domain structure. How access rights are being provided with the help of domain structure syntax. Take an example and explain. | **(6)** | **Understanding and creating** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.10** | **(a)** | Suppose in an internal violation a person in communication pretends to be someone else like another host or another person. What kind of attack it is? Explain by taking an example | **(6)** | **Analyzing and applying** |
|  |  |  |  |  |
|  | **(b)** | What are the different levels onto which the security measures are required to be performed for a secure data transmission over the network? | **(6)** | **Analyzing and applying** |