**SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY**

DEPARTMENT OF MASTER OF COMPUTR APPLICATIONS

**II SEMESTER**

SUBJECT: Operating Systems Subject Code: 16MC2T02

Regulation: R16

**UNIT I**

1. Define operating system and discuss its role from different perspectives.
2. Describe about Operating Systems structures in detail
3. State about Protection and Security for an Operating Systems
4. Summarize and explain the functions of the Operating Systems
5. Describe about different kinds of special purpose systems
6. Express the various generations of various Operating Systems
7. What is system call? Classify and explain the system calls
8. Explain the layers and working nature of an Operating Systems
9. Describe about distributed systems and its applications in detail
10. List out different services of operating system and Explain

**UNIT II**

1. Describe about process concept and process scheduling in process management.
2. Explain about Message Passing Systems in IPC
3. Illustrate the Process Scheduling concepts in OS.
4. Find and explain the average waiting time of the scheduling algorithms for the following process using FCFS,SJF,Priority and RoundRobin scheduling algorithms

|  |  |
| --- | --- |
| Process | Burst Time |
| P1 | 29 |
| P2 | 10 |
| P3 | 7 |
| P4 | 12 |
| P5 | 3 |

Quantum Time is: 10ms

1. Explain about process scheduling algorithms in OS scheduling
2. Describe about Multithread Programming Model
3. What do you mean by PCB? Where is it used? What are its contents? Explain.
4. Differentiate Preemption and Non-preemption scheduling methods

**UNIT III**

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| 1. Describe about process of synchronization in detail |
| 1. Illustrate about critical-section problem and Peterson’s solution in concurrency. |
| 1. Explain about monitors role in process synchronization |
| 1. Summarize the few examples of synchronization |
| 1. How to apply the monitors to solve the dinning philosopher’s problem with example. |
| 1. Express about Classic Problems in Synchronization |
| 1. Describe about semaphores and its roles synchronization. |
| 1. Explain the various methods for Hardware Synchronization |
| 1. Recall semaphore? Explain its usage and implementation and solution to the Bounded-Buffer problem using semaphores. |
| 1. Define monitor .State dining philosophers’ problem and give a solution using monitors. |

**UNIT IV**

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| 1. Explain about three basic page replacement algorithm with an example. |
| 1. Consider the following page reference string: 2. 7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1 3. Assuming the demand paging with three frames, how many page faults would occur for the following replacements algorithms? 4. a. LRU b. FIFO c. Optimal |
| 1. Write a short note on Hardware support on Paging Concept with neat diagram. |
| 1. Describe about segmentation. |
| 1. Consider the following segment table:   Consider the following segment table:   |  |  |  | | --- | --- | --- | | Segment | Base | Length | | 0 | 219 | 600 | | 1 | 2300 | 14 | | 2 | 90 | 100 | | 3 | 1327 | 580 | | 4 | 1952 | 96 |   What are the physical addresses for the following logical addresses?  a. 0, 430  b. 1, 10  c. 2, 500  d. 3, 400  e. 4, 112   1. What are the physical addresses for the following logical addresses?    1. 0, 430    2. 1, 10    3. 2, 500    4. 3, 400 2. e. 4, 112 |
| 1. Explain about contiguous Memory Allocation in detail |
| 1. Discuss Swapping and Paging |
| 1. Differentiate external fragmentation with internal fragmentation. |
| 1. Summaraize about Logical & Physical Addressing |
| 1. Explain about first fit, best fit, worst fit, next fit algorithms? |

**UNIT V**

1. Consider the following snapshot of a system:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Allocation | | | |  | Max | | | |
|  |  | A | B | C | D |  | A | B | C | D |
| P0 |  | 3 | 0 | 1 | 4 |  | 5 | 1 | 1 | 7 |
| P1 |  | 2 | 2 | 1 | 0 |  | 3 | 2 | 1 | 1 |
| P2 |  | 3 | 1 | 2 | 1 |  | 3 | 3 | 2 | 1 |
| P3 |  | 0 | 5 | 1 | 0 |  | 4 | 6 | 1 | 2 |
| P4 |  | 4 | 2 | 1 | 2 |  | 6 | 3 | 2 | 5 |

Using the banker’s algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the processes may complete. Otherwise, illustrate why the state is unsafe.

a) Available = (0,3,0,1)

b) Available = (1,0,0,2)

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| 1. Discuss about deadlock detection and recovery from deadlock condition methods elaborately. |
| 1. Describe the optimistic assumption made in the deadlock detection algorithm? How can this assumption be violated? |
| 1. Describe about resource allocation graph with deadlock condition example. |
| 1. Write a short note on methods for handling deadlocks. |
| 1. Explain the banker’s algorithm for deadlock prevention and avoidance with an example. |
| 1. What are conditions under which a deadlock situation may arise? |
| 1. Describe Resource Request Algorithm |
| 1. Illustrate Safety Algorithm |
| 1. Explain goals and principles of system protection in detail. |

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| 1. Discuss about file system implementation methods in detail. |
| 1. Explain the different kinds of Disk Scheduling with diagram |
| 1. Write about Directory structure and file access methods. |
| 1. Illustrate different kinds of disk scheduling algorithms with reference blocks. |
| 1. Write a note on File System Mounting in both Linux and Windows Operating System |
| 1. Describe about file system structure. |
| 1. Summaraize about file attributes, file operations, and file types? |
| 1. Explain file mounting and file sharing procedure |
| 1. Explain about single-level, two-level directory structure? |
| 1. Demonstrate swap space management and free space management in detail. |