Course Code: 19CS0511 **R19**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY :: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Operating Systems(19CS0511) **Course & Branch:** B.Tech - CSE
Year & Sem : II B.Tech & II-Sem **Regulation :** R19

UNIT –I

OPERATING SYSTEMS OVERVIEW AND SYSTEM STRUCTURES

1		Define Operating System? Explain the various types of Operating Systems.	[L1][CO1]	**[12M]**
2	**a**	Discuss Operating System Structures.	[L6][CO1]	**[08M]**
	b	Explain System Programs.	[L5][CO1]	**[04M]**
3		List the different functions of an operating system and discuss the various services provided by an operating system.	[L4][CO1]	**[12M]**
4	**a**	Examine about the dual mode operation in OS with a neat block diagram.	[L4][CO1]	**[06M]**
	b	What is operating system? Explain multiprogramming and time-sharing systems.	[L1,L2][C1]	**[06M]**
5	**a**	Determine briefly about concept of virtual machines.	[L5][CO1]	**[08M]**
	b	Write the differences between monolithic kernel and microkernel.	[L3][CO1]	**[04M]**
6	**a**	Illustrate briefly system calls with examples.	[L2][CO1]	**[08M]**
	b	Explain different operations performed by the operating system.	[L6][CO1]	**[04M]**
7		Describe Computing Environments.	[L2][CO1]	**[12M]**
8	**a**	List different types of system calls with suitable example.	[L4][CO1]	**[06M]**
	b	What are the functionalities of Operating Systems? Explain in detail.	[L1][CO1]	**[06M]**
9	**a**	Distinguish between Multitasking and Multi Programming.	[L4][CO1]	**[06M]**
	b	Discuss briefly about User and Operating System Interface.	[L6][CO1]	**[06M]**
10		Write a short note on the following: (i) Multi programming Systems (ii) Multi-Tasking Systems (iii) Multi Processor systems.	[L3][CO1]	**[12M]**

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UNIT –II

PROCESSES AND THREADS

<table>
<tr><td>1</td><td>a</td><td>Define Process? Describe process State diagram.</td><td>[L1][CO2]</td><td>[06M]</td></tr>
<tr><td></td><td>b</td><td>Explain about process schedulers.</td><td>[L2][CO2]</td><td>[06M]</td></tr>
<tr><td>2</td><td colspan="2">Consider 3 processes P1, P2 and P3, which require 5, 7 and 4 time units and arrive at time 0, 1 and 3. Draw the Gant chart, process completion sequence and average waiting time for.
i) SJF
ii) FCFS</td><td>[L5][CO2]</td><td>[12M]</td></tr>
<tr><td>3</td><td colspan="2">Determine CPU Scheduling Algorithms with examples.</td><td>[L5][CO2]</td><td>[12M]</td></tr>
<tr><td rowspan="2">4</td><td>a</td><td>Explain about Scheduling Criteria.</td><td>[L6][CO2]</td><td>[06M]</td></tr>
<tr><td>b</td><td>Evaluate FCFS CPU Scheduling algorithm for given Problem:
<table><tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td></tr><tr><td>Process Time</td><td>24</td><td>3</td><td>5</td><td>6</td></tr></table></td><td>[L5][CO2]</td><td>[06M]</td></tr>
<tr><td>5</td><td colspan="2">Build SJF , Priority CPU Scheduling algorithms for given Problem:
<table><tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td></tr><tr><td>Process Time</td><td>8</td><td>4</td><td>9</td><td>5</td></tr><tr><td>Priority</td><td>3</td><td>2</td><td>4</td><td>1</td></tr></table></td><td>[L3][CO2]</td><td>[12M]</td></tr>
<tr><td>6</td><td colspan="2">Evaluate Round CPU Scheduling algorithm for given Problem: Time slice =3 ms.
<table><tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td></tr><tr><td>Process Time</td><td>10</td><td>5</td><td>18</td><td>6</td></tr><tr><td>Arrival Time</td><td>5</td><td>3</td><td>0</td><td>4</td></tr></table></td><td>[L5][CO2]</td><td>[12M]</td></tr>
<tr><td>7</td><td colspan="2">Examine in detail about Inter Process Communication.</td><td>[L4][CO2]</td><td>[12M]</td></tr>
<tr><td>8</td><td>a</td><td>With a neat sketch explain process state diagram.</td><td>[L3][CO2]</td><td>[06M]</td></tr>
<tr><td></td><td>b</td><td>Write about Threads.</td><td>[L3][CO2]</td><td>[06M]</td></tr>
<tr><td>9</td><td>a</td><td>Differentiate between user level thread and kernel level thread.</td><td>[L4][CO2]</td><td>[06M]</td></tr>
<tr><td></td><td>b</td><td>What is synchronization? List different synchronization mechanisms.</td><td>[L1][CO2]</td><td>[06M]</td></tr>
<tr><td>10</td><td>a</td><td>Illustrate the criteria for evaluating the CPU scheduling algorithm.</td><td>[L2][CO2]</td><td>[06M]</td></tr>
<tr><td></td><td>b</td><td>What is a process? Describe Process Control Block.</td><td>[L1][CO2]</td><td>[06M]</td></tr>
</table>

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UNIT –III

PROCESS SYNCHRONIZATION AND DEADLOCKS

1		What is critical section problem? Explain with example.	[L1][CO3]	**[12M]**
2		What is Semaphore? Describe producer consumer problem using semaphore.	[L2][CO3]	**[12M]**
3		Define process synchronization and explain Peterson solution algorithms.	[L1][CO3]	**[12M]**
4		What is Monitor? Illustrate Reader's &Writer's problem using monitor.	[L2][CO3]	**[12M]**
5		Explain the solution for Dining-Philosophers Problem.	[L2][CO3]	**[12M]**
6	**a**	List various methods for handling deadlock.	[L4][CO3]	**[06M]**
	b	Write about deadlock and starvation.	[L3][CO3]	**[06M]**
7	**a**	Discuss about Deadlock Avoidance.	[L6][CO3]	**[06M]**
	b	Explain how to recover from deadlock.	[L2][CO3]	**[06M]**
8		Construct Dead lock detection (Banker's Algorithm) with Example.	[L3][CO3]	**[12M]**
9		Write about Deadlock Prevention Methods.	[L3][CO3]	**[12M]**
10		Determine the following: i) Semaphore ii) Monitor	[L5][CO3]	**[12M]**

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UNIT –IV

MEMORY MANAGEMENT, VIRTUAL MEMORY AND DISK SCHEDULING

1		Discuss about page replacement algorithms with example.	[L6][CO4]	**[12M]**
2	**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 sting 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.	[L5][CO4]	**[06M]**
	b	Explain about Swapping.	[L2][CO4]	**[06M]**
3		List various techniques for managing memory.	[L4][CO4]	**[12M]**
4		Explain the following disk scheduling algorithm with proper diagram i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN.	[L2][CO4]	**[12M]**
5	**a**	Discuss the procedure for page fault in demand paging.	[L6][CO4]	**[06M]**
	b	Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO order 86,1470,913,1774,948,1509, 1022, 1750, 130 starting from current head position. What is the total distance that disk arm moves to satisfy all the pending request for FCFS and SSTF disk scheduling algorithm?	[L6][CO4]	**[06M]**
6		Write short notes on i) Demand paging ii) Thrashing iii) Page replacement	[L3][CO4]	**[12M]**
7		Given page reference string: 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. Compare the number of page faults for LRU, FIFO and Optimal page replacement algorithm.	[L5][CO4]	**[12M]**
8	**a**	What is virtual memory? Discuss the benefits of virtual memory techniques.	[L1][CO4]	**[06M]**
	b	Write a short note on Disk management.	[L3][CO4]	**[06M]**
9		List the different Disk scheduling algorithms with their comparisons.	[L4][CO4]	**[12M]**
10	**a**	Explain the following: i) Paging ii) Segmentation	[L2][CO4]	**[08M]**
	b	What is contiguous memory allocation? Explain it.	[L1][CO4]	**[04M]**

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UNIT –V

FILE MANAGEMENT AND PROTECTION & SECURITY

1	**a**	Illustrate the concept of file with Example.	[L2][CO5]	**[06M]**
	b	Explain about access method with Example.	[L2][CO5]	**[06M]**
2	**a**	Examine common file types.	[L4][CO5]	**[06M]**
	b	List various types of file operations.	[L4][CO5]	**[06M]**
3	**a**	What is free space management technique?	[L1][CO5]	**[06M]**
	b	List different directory structures in detail.	[L4][CO5]	**[06M]**
4	Determine basic concepts of cryptography with examples.		[L5][CO5]	**[12M]**
5	Write short notes on: i) Directory Implementation. ii) File system Structure.		[L3][CO5]	**[12M]**
6	Briefly explain indexed and Linked list free space management technique.		[L2][CO5]	**[12M]**
7	**a**	Explain about Grouping Free space management technique.	[L2][CO5]	**[06M]**
	b	How directory can be Implemented using linear list.	[L1][CO5]	**[06M]**
8	Discuss Authentication techniques briefly.		[L6][CO5]	**[12M]**
9	**a**	Illustrate protection mechanisms.	[L2][CO5]	**[08M]**
	b	Write a short note on Threats.	[L3][CO5]	**[04M]**
10	Determine file allocation methods in detail.		[L5][CO5]	**[12M]**

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