



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Operating Systems(20CS0507)

Course & Branch: B.Tech & CSE, CSM, CIC

Year & Sem : II B.Tech & I Sem

Regulation : R20

UNIT –I

OPERATING SYSTEMS OVERVIEW AND SYSTEM STRUCTURES

1		Define Operating System? Explain the various types of Operating Systems.	[L2][CO1]	[12M]
2	a.	List and discuss the different functions of an operating system	[L4][CO1]	[08M]
	b	Explain different operations performed by the operating system.	[L2][CO1]	[04M]
3		Describe Computing Environments.	[L2][CO1]	[12M]
4	a	What are the functionalities of Operating Systems? Explain in detail.	[L2][CO1]	[06M]
	b	What is operating system? Explain multiprogramming and time-sharing systems.	[L2][CO1]	[06M]
5	a	Distinguish between Multitasking and Multiprogramming.	[L4][CO1]	[06M]
	b	Discuss the few of the services provided by an operating system.	[L6][CO1]	[06M]
6		Write a short note on the following: I) Real Time Systems II) Distributed Systems III) Simple batch systems.	[L3][CO1]	[12M]
7	a	Examine about the dual mode operation in OS with a neat block diagram.	[L4][CO1]	[06M]
	b	List different types of system calls with suitable example.	[L4][CO1]	[06M]
8	a	Determine briefly about concept of virtual machines.	[L5][CO1]	[08M]
	b	Write the differences between monolithic kernel and microkernel.	[L3][CO1]	[04M]
9	a	Illustrate briefly system calls with examples.	[L2][CO1]	[08M]
	b	Explain System Programs.	[L5][CO1]	[04M]
10	a	Discuss any two operating system structures.	[L6][CO1]	[06M]
	b	Discuss briefly about User and Operating System Interface.	[L6][CO1]	[06M]

UNIT –II**PROCESSES AND THREADS**

1	a	Define Process? Describe process State diagram.	[L1][CO2]	[06M]															
	b	Explain about process schedulers.	[L2][CO2]	[06M]															
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	[L5][CO2]	[12M]															
3		Determine CPU Scheduling Algorithms with examples.	[L5][CO2]	[12M]															
4	a	Explain about Scheduling Criteria.	[L5][CO2]	[06M]															
	b	Evaluate FCFS CPU Scheduling algorithm for given Problem: <table border="1" style="margin-left: auto; margin-right: auto;"> <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>	Process	P1	P2	P3	P4	Process Time	24	3	5	6	[L5][CO2]	[06M]					
Process	P1	P2	P3	P4															
Process Time	24	3	5	6															
5		Build SJF ,Priority CPU Scheduling algorithms for given Problem: <table border="1" style="margin-left: auto; margin-right: auto;"> <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>	Process	P1	P2	P3	P4	Process Time	8	4	9	5	Priority	3	2	4	1	[L3][CO2]	[12M]
Process	P1	P2	P3	P4															
Process Time	8	4	9	5															
Priority	3	2	4	1															
6		Evaluate Round CPU Scheduling algorithm for given Problem: Time slice =3ms. <table border="1" style="margin-left: auto; margin-right: auto;"> <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>	Process	P1	P2	P3	P4	Process Time	10	5	18	6	Arrival Time	5	3	0	4	[L5][CO2]	[12M]
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Process Time	10	5	18	6															
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7		Examine in detail about Inter Process Communication.	[L4][CO2]	[12M]															
8	a	What is synchronization? List different synchronization mechanisms.	[L1][CO2]	[06M]															
	b	Write about Threads.	[L3][CO2]	[06M]															
9	a	Differentiate between user level thread and kernel level thread.	[L4][CO2]	[06M]															
	b	With a neat sketch explain process state diagram.	[L3][CO2]	[06M]															
10	a	Difference between thread and process	[L2][CO2]	[06M]															
	b	Discuss multithreading models with neat diagrams	[L6][CO2]	[06M]															

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 semaphore.	[L2][CO3]	[12M]
5	Explain the solution for Dining-Philosophers Problem.	[L2][CO3]	[12M]
6	Determine the following: i) Semaphore ii) Monitor	[L5][CO3]	[12M]
7	Suppose there are 2 copies of resource A, 3 copies of resource B, and 3 copies of resource C. Suppose further that process 1 holds one unit of resources B and C and is waiting for a unit of A; that process 2 is holding a unit of A and waiting on a unit of B; and that process 3 is holding one unit of A, two units of B, and one unit of C. (a) Draw the resource allocation graph. (b) Is the system in a deadlocked state? Why or why not?	[L6][CO3]	[12M]
8	Explain the Banker's algorithm for deadlock avoidance with an example.	[L2][CO3]	[12M]
9	Construct Dead lock detection (Banker's Algorithm) with an example.	[L3][CO3]	[12M]
10	Write about Deadlock Prevention Methods.	[L3][CO3]	[12M]

UNIT –IV**MEMORY MANAGEMENT, VIRTUAL MEMORY AND DISK SCHEDULING**

1	a	Explain about Swapping.	[L2][CO4]	[06M]
	b	What is contiguous memory allocation? Explain it.	[L1][CO4]	[06M]
2	a	What is memory management? List various techniques for managing memory.	[L4][CO4]	[4M]
	b	Explain the following: i) Paging ii) Segmentation	[L5][CO4]	[08M]
3	a	What is virtual memory? Discuss the benefits of virtual memory techniques.	[L1][CO4]	[06M]
	b	Discuss the procedure for page fault in demand paging.	[L6][CO4]	[06M]
4		Discuss about page replacement algorithms with example.	[L6][CO4]	[12M]
5		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.	[L5][CO4]	[12M]
6		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]
7		Write short notes on i) Demand paging ii) Thrashing iii) Page replacement	[L3][CO4]	[12M]
8		Explain the following disk scheduling algorithm with proper diagram i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN.	[L2][CO4]	[12M]
9	a	Write a short note on Disk management.	[L3][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]
10		List the different Disk scheduling algorithms with their comparisons.	[L4][CO4]	[12M]

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 file allocation methods in detail.	[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.	[L6][CO5]	[06M]
	b	How directory can be Implemented using linear list.	[L1][CO5]	[06M]
8		Determine basic concepts of cryptography with examples.	[L5][CO5]	[12M]
9		Discuss Authentication techniques briefly.	[L6][CO5]	[12M]
10	a	Illustrate protection mechanisms.	[L2][CO5]	[08M]
	b	Write a short note on Threats.	[L3][CO5]	[04M]

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