Operating System Question Bank

Course Outcomes:

Upon successful completion of the course, students will be able to
1. Identify basic structure and purpose of operating system.
2. Interprete the concepts of process & File management.
3. Illustrate various CPU scheduling alogorithms.
4. Analyze different memory management techniques with advantages and disadvantages.
5. Schematize Deadlock & security mechanisms in operating systems.
6. Choose various advances in OS and its applications.

CO1. Q

1. Differentiate between tightly coupled systems and loosely coupled systems.
2. Define OS
3. What are the differences between Batch OS and Multiprogramming?
4. What are the differences between Multitasking and Multiprogramming?
5. List the difference between mainframe & desktop OS.
6. What are the three main purposes of an operating system?
7. What is Real Time System? List out their types.
8. List the various services provided by an operating system.
9. What are the system components of an operating system and explain them?
10. What do you mean by system calls
11. explain interrupt, Direct Memory Access in detail.
12. What are the system components of an operating system and explain them?
13. . What is function of system programs? Write the categories in which system program c
14. What do you mean by system calls?
15. Explain in detail about the categories of system calls?
16. What is the kernel?
17. State the advantage of multiprocessor system
18. what is real time system .List out their types
19. Distinguish among following terminologies i) Multiprogramming systems ii) Multitasking
20. Briefly explain virtual machines?

CO2. Q

1. Explain the following i) file types ii) file operation iii) file attributes.
2. Explain the method used for implementing directories.
3. Describe various file access methods.
4. Explain file system mounting operation.
5. Mention the different file attributes and file types.
6. How free space is managed?
7. What are the three methods for allocating disk space? Explain.
8. Explain different free space management techniques in detail.
9. Explain the following wrt file a) Concept of file b) Access methods c) File sharing d) File
10. Explain disk structure in detail.
11. Explain swap space management in detail.
12. Explain different Disk scheduling algorithms SCAN,CSCAN.CLOOK
13. Give overview of mass storage structure in detail.
14. Describe the life cycle of an I/O request in detail.
15. Describe the Windows XP file system in detail.
16. Explain the directory structure of Linux operating system.

CO3. Q

1. If the CPU Scheduling Policy is First Come First Serve(FCFS), then find the Completion

Process No.	Arrival time	Burst time
1	0	4
2	1	5
3	2	2
4	3	3
5	4	6

2. If the CPU Scheduling Policy is Shortest-job-first with Preemptive approach, then find the

Process No.	Arrival time	Burst time
1	0	6
2	1	2
3	2	4
4	3	1
5	4	3
6	6	5

3. If the CPU Scheduling Policy is First Come First Serve(FCFS), then find the Completion

Process No.	Arrival time	Burst time
1	9	7
2	8	3
3	2	4
4	4	5
5	5	6
6	3	2

4. If the CPU Scheduling Policy is Shortest-job-first with Preemptive approach, then find the

Process No.	Arrival time	Burst time
1	0	8
2	1	4
3	2	9
4	3	5

5. If the CPU Scheduling Policy is Shortest-job-first with Non-Preemptive approach, then fir

Process No.	Arrival time	Burst time
1	0	8
2	1	4
3	2	9
4	3	5

6. If the CPU Scheduling Policy is Shortest-job-first with Non-Preemptive approach, then fir

Process No.	Arrival time	Burst time
1	0	6
2	1	2
3	2	4
4	3	1
5	4	3
6	6	5

7. Enlist the different types of schedulers.

8. Consider 4 processes with arrival time as [0, 7, 9, 10] and Burst Time as [5, 3, 5

9. Consider 4 processes with arrival time as [0, 2, 0, 8] and Burst Time as [6, 4, 6, 5], write

10. Consider 4 processes with arrival time as [0, 1, 2, 4] and Burst Time as [5, 3, 3

11. Consider 4 processes with arrival time as [0, 2, 3, 8] and Burst Time as [12, 4,

12. Consider the following set of processes, the length of the CPU burst time given in millis

Process Burst time
P1   6
P2   8
P3   7
P4   3

Assuming the above process being scheduled with the SJF scheduling algo

13. If the CPU Scheduling Policy is Priority Based scheduling with Preemptive approach, th

Process No.	Arrival time	Burst time	Priority
1	3	7	8
2	7	2	2
3	2	8	6
4	6	3	4
5	4	6	9
6	5	4	5

14. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

If the CPU scheduling policy is Round Robin with time quantum = 2 unit, calculate the aver

15. Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	4
P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	6	3

If the CPU scheduling policy is Round Robin with time quantum = 2, calculate the average

CO4. Q

1 Explain the difference between logical and physical addresses?
2 Explain paging in detail.
3 Explain Segmentation in detail.
4 What is demand paging? Explain it with address translation mechanism used. What are its
5 What is virtual memory? How it is implemented.
6 Explain following page replacement algorithm in detail. i. LRU ii. FIFO
7 Explain the following page replacement algorithm. a) Optimal page replacement b) Least re
8 Consider the following page reference string. 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2How
9 Describe the term page fault frequency. What is thrashing? How is it controlled by OS?
10 A certain computer provides its user with a virtual memory space of 2^32 bytes. The compu
11 Explain difference between internal external fragmentations in detail
12 Write short on:
13 Explain following allocation algorithm. a. First fit b. Best fit c. Worst fit d. Next fit
14 What are the memory management requirements?
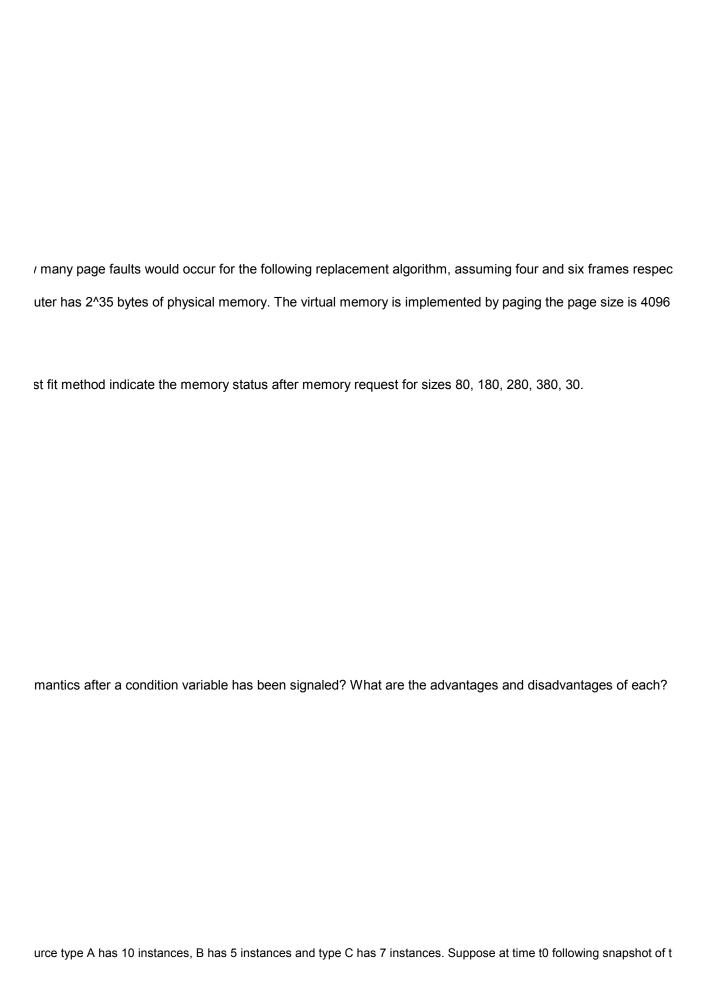15 Explain static partitioned allocation with partition sizes 300,150, 100, 200, 20. Assuming firs

CO5. Q

1 Why do we need to synchronize processes/threads?
2 What do you mean by cooperating process? Describe its four advantages.
3 What is synchronization? Explain its hardware.
4 Explain three requirements that a solution to critical–section problem must satisfy.
5 What is Producer Consumer problem? How it can illustrate the classical problem of synchr
6 What are semaphores? Explain two primitive semaphore operations. What are its advantag
7 What do you mean by binary semaphore and counting semaphore? With C struct, explain i
8 Describe term monitor. Explain solution to dining philosopher's problem using monitor.
9 What are semaphores? Explain solution to producer-consumer problem using semaphores
10 Explain the concept of Mutex locks in detail.
11 Explain the concept of IPC in detail.
12 Explain Locks and barriers with respect to IPC.
13 Write a detailed notes on Monitors.
14 What is a critical section? Give examples.
15 What is monitor? Explain its functionalities. How it is different from semaphore in impleme
16 What is a monitor? What is a condition variable? What are the two possible resumption se
17 What are the advantages of inter-process communication? How communication takes plac

CO6. Q

1 What are the necessary conditions for deadlock?
2 Explain Deadlock Detection scheme for Several Instances of a resource Type.
3 Discuss various techniques to recover from the deadlock.
4 Is it possible to have a deadlock involving only a single process? Explain.
5 Why is deadlock state more critical than starvation? Describe resource allocation graph wit
6 What are two options for breaking deadlock?
7 Describe the Safe, unsafe, and deadlock state spaces
8 Explain Banker's deadlock-avoidance algorithm with an illustration.
9 In what way resource allocation graphs are used for detection of deadlocks? Write the algo
10 What is the difference between deadlock detection and deadlock prevention?
11 After detecting deadlock, what options are conceivable for recovering from deadlock?
12 What is a safe state? What is the difference between an unsafe state and a deadlocked sta
13 Considering a system with five processes P0 through P4 and three resources of type A, B, C. Resou

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Time(CT), Turn Around Time(TAT), and Waiting Time(WT) for each process. The Arrival Time and Burst Tir

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5, 6], write a program to find average turn-around time and average waiting time using First Come I

a program to find average turn-around time and average waiting time using Shortest Job First (SJF) algorithm

3, 1], write a program to find average turn-around time and average waiting time using First Come I

6, 5], write a program to find average turn-around time and average waiting time using Shortest Jo

en find the Avg. Completion Time(CT), Avg. Turn Around Time(TAT), and Avg. Waiting Time(WT) for each p

many page faults would occur for the following replacement algorithm, assuming four and six frames respec

uter has 2^35 bytes of physical memory. The virtual memory is implemented by paging the page size is 4096

st fit method indicate the memory status after memory request for sizes 80, 180, 280, 380, 30.

mantics after a condition variable has been signaled? What are the advantages and disadvantages of each?

urce type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t0 following snapshot of t

and Burst Time(Service Time) are given below for each process. Write a C program for this-

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process. The Arrival Time and Burst Time(Service Time) are given below for each process. Draw the Gantt Ch

bytes. A user process generates the virtual address 11123456. Explain how the system establishes the corre

sponding physical location. 110. Calculate page faults for (LRU, FIFO, OPT) for following sequences where p

page frame is three. 0,1,2,1,4,2,3,7,2,1,3,5,1,2,5.