

**(An Autonomous Institution, Affiliated to Anna University, Chennai)**

**QUESTION BANK**

|  |  |  |  |
| --- | --- | --- | --- |
| **NAME OF THE DEPARTMENT** | [**CSBS**](https://www.citchennai.edu.in/wp-content/uploads/2023/10/04.B.Tech_.CSBS_.pdf) | | |
| **YEAR / SEMESTER** | **II/IV** | | |
| **REGULATION** | **R21** | | |
| **SUBJECT CODE** | **CS2401 /AD2401/AM2401/CS2401** | | |
| **SUBJECT NAME** | **OPERATING SYSTEM** | | |
| **FACULTY NAME** | **Mr. K. SURESH KUMAR** | **Contact Number** | **9750085097** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **UNIT-I: INTRODUCTION** | | | | | |
| Computer System - Elements and organization; Operating System Overview - Objectives and Functions - Evolution of Operating System; Operating System Structures – Operating System Services - User Operating System Interface - System Calls – System Programs - Design and Implementation - Structuring methods. | | | | | |
| **PART-A (2-Marks)** | | | | | |
| **S.NO** | **QUESTIONS** | **CO** | **RBT LEVEL** | | |
| 1 | List and briefly define the four main elements of a computer? | C1 | BTL1 | | |
| 2 | What is an interrupt? | C1 | BTL1 | | |
| 3 | What is a system call? | C1 | BTL1 | | |
| 4 | What is an interrupt vector? | C1 | BTL1 | | |
| 5 | Define bootstrap program | C1 | BTL1 | | |
| 6 | Define operating system | C1 | BTL1 | | |
| 7 | What is a resource allocator? | C1 | BTL2 | | |
| 8 | What is Moore’s law? | C1 | BTL1 | | |
| 9 | What is kernel? | C1 | BTL2 | | |
| 10 | Draw the storage device hierarchy | C1 | BTL2 | | |
| 11 | What is fault tolerant? | C1 | BTL1 | | |
| 12 | Define job pool | C1 | BTL1 | | |
| 13 | What are the types of operation in operating system ? | C1 | BTL2 | | |
| 14 | What is a privileged instruction? | C1 | BTL2 | | |
| 15 | What is a trap? | C1 | BTL1 | | |
| 16 | What is bitmap? | C1 | BTL1 | | |
| 17 | What is real time operating system? | C1 | BTL1 | | |
| 18 | What is boot disk? | C1 | BTL2 | | |
| 19 | Draw the system structure for unix | C1 | BTL2 | | |
| 20 | What is the layered approach in OS? | C1 | BTL2 | | |
| **PART-B (13- Marks or 8-Marks)** | | **CO** | **BT Level** | **Marks** | |
| 1 | Explain in detail the modern computer system | C1 | BTL2 | **13** | |
| 2 | Explain the abstract view of the components of a computer system | C1 | BTL2 | **13** | |
| 3 | Explain Von Neumann architecture | C1 | BTL2 | **13** | |
| 4 | Explain multiprocessor system | C1 | BTL2 | **13** | |
| 5 | Explain the various structures of an operating system | C1 | BTL2 | **13** | |
| 6 | Explain computing environments | C1 | BTL2 | **13** | |
| 7 | Explain open-source operating system | C1 | BTL2 | **13** | |
| 8 | Explain in detail the operating system services | C1 | BTL2 | **13** | |
| 9 | Explain in detail operating system structure | C1 | BTL2 | **13** | |
| 10 | Write about OS generation. | C1 | BTL2 | **13** | |
| 11 | Enumerate the different operating system structure and explain with neat sketch | C1 | BTL2 | **13** | |
| 12 | Explain system calls, system programs and OS generation | C1 | BTL2 | **13** | |
| 13 | Discuss about the functionality of system boot with respect to operating system. | C1 | BTL4 | **13** | |
| 14 | Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems | C1 | BTL4 | **8** | |
| 15 | Explain in detail the types of system calls provided by a typical operating system. | C1 | BTL2 | **8** | |
| 16 | Describe evolution of operating system. | C1 | BTL4 | **13** | |
| 17 | Discuss about the functionality of system boot with respect to operating system. | C1 | BTL4 | **13** | |
| 18 | Explain the concept of multiprocessor and Multi-core organizations | C1 | BTL2 | **13** | |
| 19 | Explain Cache memory and its mapping | C1 | BTL2 | **13** | |
| 20 | Explain the various types of System calls with an example for each? | C1 | BTL2 | **8** | |
| **PART-C (15-Marks)** | | **CO** | **BT Level** | | **Marks** |
| 1 | State the operating system structure. Describe the operating-system operations in detail. Justify the reason why the lack of a hardware-supported dual mode an cause serious shortcoming in an operating system? | C1 | **BT4** | | **15** |
| 2 | Explain in detail the difference architecture of OS starting from simple structure, Layered structure, micro kernel, modules and hybrid system with suitable example OS structures, including Google‘s android. | C1 | **BT4** | | **15** |
| 3 | Discuss in detail about the various memory hierarchies with neat block diagram. | C1 | **BT4** | | **15** |
| 4 | What is a virtual machine? List out the advantages of virtualization. Explain the creation of a Virtual machine with a architecture diagram | C1 | **BT4** | | **15** |
| 5 | Explain system calls, system programs and OS generation | C1 | **BT4** | | **15** |
| **UNIT-II:** PROCESS MANAGEMENT | | | | | |
| Processes - Process Concept - Process Scheduling - Operations on Processes - Inter-process Communication; CPU Scheduling - Scheduling criteria - Scheduling algorithms: Threads - Multithread Models – Threading issues; Process Synchronization - The Critical-Section problem - Synchronization hardware – Semaphores – Mutex - Classical problems of synchronization - Monitors; Deadlock - Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock. | | | | | |
| **PART-A (2-Marks)** | | | | | |
| **S.NO** | **QUESTIONS** | **CO** | **RBT LEVEL** | | |
| 1 | Define Process | C2 | BTL1 | | |
| 2 | Draw & briefly explain the process states? | C2 | BTL1 | | |
| 3 | Define throughput? | C2 | BTL2 | | |
| 4 | Define Threads. | C2 | BTL1 | | |
| 5 | What are the types of Schedulers? | C2 | BTL1 | | |
| 6 | What is Context Switch? | C2 | BTL2 | | |
| 7 | What is Co-operative Process? | C2 | BTL1 | | |
| 8 | Define IPC. | C2 | BTL1 | | |
| 9 | What are Remote procedure Calls? | C2 | BTL2 | | |
| 10 | Define threads. | C2 | BTL1 | | |
| 11 | What is multicore Programming? | C2 | BTL1 | | |
| 12 | Define Multithreading | C2 | BTL1 | | |
| 13 | What is critical section problem? | C2 | BTL1 | | |
| 14 | What are semaphores? | C2 | BTL1 | | |
| 15 | Define race condition | C2 | BTL2 | | |
| 16 | What is preemptive Scheduling? | C2 | BTL1 | | |
| 17 | What is Non-Preemptive Scheduling? | C2 | BTL2 | | |
| 18 | What are the scheduling Criteria? | C2 | BTL2 | | |
| 19 | What is the scheduling algorithm? | C2 | BTL1 | | |
| 20 | Define Dead Locks. | C2 | BTL1 | | |
| **PART-B (13- Marks or 8-Marks)** | | **CO** | **BT Level** | **Marks** | |
| 1 | Explain the various process state | C2 | BTL2 | **8** | |
| 2 | Explain the inter-process communication | C2 | BTL4 | **13** | |
| 3 | Explain about remote procedure calls | C2 | BTL4 | **8** | |
| 4 | Explain about Multi threading models | C2 | BTL4 | **8** | |
| 5 | Explain about various scheduling algorithms. | C2 | BTL3 | **13** | |
| 6 | Explain in detail about the critical section problem. | C2 | BTL4 | **13** | |
| 7 | Explain the FCFS, preemptive and non-preemptive versions of Shortest-Job First and Round Robin (time slice = 2) scheduling algorithms with Gantt charts for the four Processes given. Compare their average turnaround and waiting time.   |  |  |  | | --- | --- | --- | | **Process** | **Arrival Time** | **Waiting Time** | | P1 | 0 | 8 | | P2 | 1 | 4 | | P3 | 2 | 9 | | P4 | 3 | 5 | | C2 | BTL3 | **13** | |
| 8 | Explain in detail about semaphores and monitors | C2 | BTL4 | **13** | |
| 9 | Explain about deadlock prevention and deadlock avoidance algorithms | C2 | BTL3 | **13** | |
| 10 | What is deadlock? What are the necessary conditions for deadlock to occur? Explain the deadlock prevention method of handling deadlock. | C2 | BTL4 | **13** | |
| 11 | What is a race condition? Explain how a critical section avoids this condition. What are the properties which a data item should possess to implement a critical section? Describe a solution to the Dining philosopher problem so that to races arise. | C2 | BTL3 | **13** | |
| 12 | What is the average turnaround time for the following processes using  a) FCFS  b) SJF non-preemptive  c) Preemptive SJF. | C2 | BTL3 | **13** | |
| 13 | Consider the following set of processes, with the length of the CPU – burst time given in Milliseconds:   |  |  |  | | --- | --- | --- | | **Process** | **Burst Time** | **Waiting Time** | | P1 | 10 | 3 | | P2 | 1 | 1 | | P3 | 2 | 3 | | P4 | 1 | 4 | | P5 | 5 | 2 |   The processes are arrived in the order P1, P2, P3, P4, P5, all at time 0. 1. Draw 4 Gantt charts illustrating the execution of these processes using FCFS, SJF Priority and RR (Time Slice = 1) scheduling 2. What is the turnaround time of each process for each of the scheduling? 3. Calculate the waiting time for each of the process | C2 | BTL3 | **13** | |
| 14 | How monitors help in process synchronization. | C2 | BTL3 | **8** | |
| 15 | What is a process? Discuss components of process and various states of a process with the help of a process state transition diagram | C2 | BTL4 | **13** | |
| 16 | Discuss how scheduling algorithms are selected for a system. What are the criteria considered? Explain the different evaluation Methods. | C2 | BTL4 | **13** | |
| 17 | Consider the following questions based on the banker‘s algorithm:   |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Max | Allocation | | | | Need | | | | Available | | | | |  | A | B | C | D | A | B | C | D | A | B | C | D | | P0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 5 | 2 | 0 | | P1 | 1 | 0 | 0 | 0 | 1 | 7 | 5 | 0 |  |  |  |  | | P2 | 1 | 3 | 5 | 4 | 2 | 3 | 5 | 6 |  |  |  |  | | P3 | 0 | 6 | 3 | 2 | 0 | 6 | 5 | 2 |  |  |  |  | | P4 | 0 | 0 | 1 | 4 | 0 | 6 | 5 | 6 |  |  |  |  |   (1) Define safety algorithm. (2) What is the content of the matrix Need? (3) Is the system in a safe state? (4) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately? | C2 | BTL4 | **13** | |
| 18 | Consider the following set of processes, with the length of the CPU-burst time in given ms:   |  |  |  | | --- | --- | --- | | **Process** | **Burst Time** | **Arrival Time** | | P1 | 8 | 0.00 | | P2 | 4 | 1.001 | | P3 | 9 | 2.001 | | P4 | 5 | 3.001 | | P5 | 3 | 4.001 |   Draw four Gantt charts illustrating the execution of these processes using FCFC, SJF, Priority and RR (Quantum=2) scheduling. Also calculate waiting time and turnaround time for each scheduling algorithms | C2 | BTL4 | **13** | |
| 19 | Write the difference between user thread and kernel thread. | C2 | BTL4 | **8** | |
| 20 | Discuss about the issues to be considered in the multithreaded program. | C2 | BTL4 | **8** | |
| **PART-C (15-Marks)** | | **CO** | **BT Level** | | **Marks** |
| 1 | Discuss in detail the critical section problem and also write the algorithm for Readers Writers Problem with semaphores | C2 | BTL4 | | **15** |
| 2 | Explain the FCFS, preemptive and non-preemptive versions of Shortest-Job First and Round Robin (time slice = 2) scheduling algorithms with Gantt charts for the four Processes given. Compare their average turnaround and waiting time   |  |  |  | | --- | --- | --- | | **Process** | Arrival Time | **Waiting Time** | | **P1** | **0** | **10** | | **P2** | **1** | **6** | | **P3** | **2** | **12** | | **P4** | **3** | **15** |   Discuss how deadlocks could be detected in detail. | C2 | BTL4 | | **15** |
| 3 | Consider the following system snapshot using data structures in the Banker‘s algorithm, with resources A, B, C and D and process P0 to P4  Using Banker‘s algorithm, answer the following questions  a) How many resources of type A, B, C and D are there? **(2)**  b) What are the contents of the need matrix? **(3)**  c) Is the system in a safe state? Why? **(3)**  d) If a request from process P4 arrives for additional resources of (1,2,0,0) ,can the Banker‘s algorithm grant the request immediately ? Show the new system state and other criteria | C2 | BTL4 | | **15** |
| 4 | Consider the following snapshot of a system: P0 – P4 are 5 processes present and A, B, C, D are the resources. The maximum need of a Process and the allocated resources details are given in the table. Answer the following based on banker‘s algorithm.  (1) What is the content of NEED matrix?  (2) Is the system in a safe state?  (3) If a request from process P0 arrives for (0, 2, 0) can the request be granted immediately   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | Max | | | Allocation | | | Available | | | |  | A | B | C | A | B | C | A | B | C | | P0 | 0 | 1 | 0 | 7 | 5 | 3 | 3 | 3 | 2 | | P1 | 2 | 0 | 0 | 3 | 2 | 2 |  |  |  | | P2 | 3 | 0 | 2 | 9 | 0 | 2 |  |  |  | | P3 | 2 | 1 | 1 | 2 | 2 | 2 |  |  |  | | P4 | 0 | 0 | 2 | 4 | 3 | 3 |  |  |  | | C2 | BTL4 | | **15** |
| 5 | Explain the Banker algorithm for deadlock avoidance in detail with an example | C2 | BTL4 | | **15** |
| **UNIT-III: MEMORY MANAGEMENT** | | | | | |
| Main Memory - Swapping - Contiguous Memory Allocation – Paging - Structure of the Page Table - Segmentation, Segmentation with paging; Virtual Memory - Demand Paging – Copy on Write - Page Replacement - Allocation of Frames –Thrashing. | | | | | |
| **PART-A (2-Marks)** | | | | | |
| **S.NO** | **QUESTIONS** | **CO** | **RBT LEVEL** | | |
| 1 | Why page are sizes always powers of 2? | C3 | BTL2 | | |
| 2 | Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. | C3 | BTL2 | | |
| 3 | What is Overlays? | C3 | BTL1 | | |
| 4 | Define Swapping | C3 | BTL2 | | |
| 5 | What is Paging? | C3 | BTL1 | | |
| 6 | Define segmentation. | C3 | BTL1 | | |
| 7 | What is Hit ratio? | C3 | BTL1 | | |
| 8 | What is TLB? | C3 | BTL2 | | |
| 9 | What is Virtual Memory? | C3 | BTL1 | | |
| 10 | What is demand paging? | C3 | BTL2 | | |
| 11 | How to calculate Effective access time in Demand Paging? | C3 | BTL2 | | |
| 12 | What is memory mapping approach? | C3 | BTL2 | | |
| 13 | What are the page replacement algorithms? | C3 | BTL1 | | |
| 14 | Compare LRU and Optimal Replacement Algorithm | C3 | BTL2 | | |
| 15 | Define Allocation Algorithm. | C3 | BTL2 | | |
| 16 | Compare the Global and Local Allocation? | C3 | BTL2 | | |
| 17 | What is Thrashing? | C3 | BTL2 | | |
| 18 | Consider a logical address space of eight pages of 1024 words each mapped onto a physical memory of 32 frames a) How many bits are in the logical address? b) How many bits are in the physical address? | C3 | BTL1 | | |
| 19 | Difference between internal and external fragmentation. | C3 | BTL1 | | |
| 20 | Difference between logical and physical address. | C3 | BTL1 | | |
| **PART-B (13- Marks Or 8-Marks)** | | **CO** | **RBT Level** | **Marks** | |
| 1 | Explain in detail Contiguous Memory Allocation. | C3 | BTL3 | **8** | |
| 2 | Explain in detail about segmentation. | C3 | BTL4 | **8** | |
| 3 | Explain in detail about paging. Explain the various page table structures in detail | C3 | BTL3 | **13** | |
| 4 | Explain in detail about segmentation with paging. | C3 | BTL4 | **13** | |
| 5 | Describe the following allocation algorithms:  a. First fit  b. Best fit  c. Worst fit | C3 | BTL4 | **13** | |
| 6 | Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB ( in order), how would each off the first‐fit, best‐fit, and worst‐fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order) ? Which algorithm makes the most efficient use of memory? | C3 | BTL4 | **13** | |
| 7 | Explain demand paging. | C3 | BTL4 | **13** | |
| 8 | Explain page replacement algorithms. | C3 | BTL4 | **13** | |
| 9 | Consider the following page‐reference string: 1,2,3,4,,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6  How many page faults would occur for the following replacement algorithms, assuming two, three frames?  Remember that all frames are initially empty, so your first unique pages will all cost one fault each.   * LRU replacement * FIFO replacement * Optimal replacement | C3 | BTL4 | **13** | |
| 10 | Explain in detail about Thrashing. | C3 | BTL3 | **8** | |
| 11 | Describe the hierarchical paging technique for structuring page tables. | C3 | BTL3 | **13** | |
| 12 | Explain the principles of segmented and paging implemented in memory with a diagram. | C3 | BTL4 | **13** | |
| 13 | Write short notes on LRU, FIFO and clock replacement strategies? | C3 | BTL3 | **13** | |
| 14 | Given memory partitions of 100KB, 500KB, 200KB, 300KB and 600KB(in order), how would each of the first-fit, best-fit and worst-fit algorithms place processes of212KB, 417KB, 12KB and 426KB(in order)? Which algorithm makes the most efficient use of memory? | C3 | BTL3 | **13** | |
| 15 | Explain in briefly and compare, fixed and dynamic memory partitioning schemes. | C3 | BTL4 | **13** | |
| 16 | When do page faults occur? Consider the reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults and page fault rate occur for the FIFO, LRU and optimal replacement algorithms, assuming one, two, three, four page frames? | C3 | BTL4 | **13** | |
| 17 | Explain the concept of demand paging in detail with neat diagram | C3 | BTL3 | **13** | |
| 18 | Why are translation look-aside buffers important? Explain the details stored in a TLB table entry? | C3 | BTL3 | **13** | |
| 19 | Explain in detail about page replacement algorithm with suitable example. | C3 | BTL4 | **13** | |
| 20 | What is thrashing? Explain the working set model in detail. | C3 | BTL4 | **8** | |
| **PART-C (15-Marks)** | | **CO** | **BT Level** | | **Marks** |
| 1 | Describe the hierarchical paging technique for structuring page tables. | C3 | BTL | | **15** |
| 2 | Explain the segmentation with paging implemented in OS/2 32-bit IBM system. Describe the following algorithms: a. First fit b. Best Fit c. Worst Fit | C3 | BTL | | **15** |
| 3 | Explain how paging supports virtual memory. With a neat diagram explain how logical addressis translated into physical address. | C3 | BTL | | **15** |
| 4 | Draw the diagram of segmentation memory management scheme and explain its principle. | C3 | BTL | | **15** |
| 5 | Consider the following page reference string 1,2,3,4,2,1,5,6,2,1,3,7,6,3,2,1,3,6. How many page faults would occur for the following replacement algorithms, assuming one, two, three and four frames?  i)LRU replacement ii) FIFO replacement | C3 | BTL | | **15** |
| **UNIT-IV:** STORAGE MANAGEMENT | | | | | |
| Mass Storage system – Disk Structure - Disk Scheduling and Management; File-System Interface - File concept - Access methods - Directory Structure - Directory organization – File system mounting - File Sharing and Protection; File System Implementation - File System Structure - Directory implementation - Allocation Methods - Free Space Management; I/O Systems – I/O Hardware, Application I/O interface, Kernel I/O subsystem. | | | | | |
| **PART-A (2-Marks)** | | | | | |
| **S.NO** | **QUESTIONS** | **CO** | **RBT LEVEL** | | |
| 1 | What is a file? | C4 | BTL1 | | |
| 2 | What are the various file operations? | C4 | BTL2 | | |
| 3 | What are the types of disk scheduling? | C4 | BTL2 | | |
| 4 | What is Physical formatting of the disk? | C4 | BTL2 | | |
| 5 | What is logical formatting of the disk? | C4 | BTL1 | | |
| 6 | What are the different accessing methods of a file? | C4 | BTL2 | | |
| 7 | What are the various disk-scheduling algorithms? | C4 | BTL2 | | |
| 8 | List the various file attributes. | C4 | BTL2 | | |
| 9 | What are the File types? | C4 | BTL1 | | |
| 10 | What is the use of boot block? | C4 | BTL2 | | |
| 11 | What is meant by polling? | C4 | BTL2 | | |
| 12 | Define single level directory,Two‐level directory. | C4 | BTL2 | | |
| 13 | Define rotational latency and disk bandwidth. | C4 | BTL2 | | |
| 14 | Write a brief note on RAID | C4 | BTL1 | | |
| 15 | What are the operations that can be performed on a directory? | C4 | BTL1 | | |
| 16 | What are the allocation methods for disk space? | C4 | BTL1 | | |
| 17 | Define UFD and MFD | C4 | BTL2 | | |
| 18 | What is garbage collection? | C4 | BTL1 | | |
| 19 | State any three disadvantages of placing functionality in a device controller, rather than in the kernel. | C4 | BTL2 | | |
| 20 | Define seek time and latency time. | C4 | BTL2 | | |
| **PART-B (13- Marks or 8-Marks)** | | **CO** | **BT Level** | **Marks** | |
| 1 | Explain and compare FCFS, SSTF, C-SCAN and C-LOOK disk scheduling algorithms with examples. | C4 | BTL3 | **13** | |
| 2 | Write short notes on disk management. | C4 | BTL3 | **8** | |
| 3 | Write short notes on file system in Linux. | C4 | BTL3 | **8** | |
| 4 | Write an elaborate note on RAID and RAID Levels. | C4 | BTL4 | **8** | |
| 5 | Write short notes on  1. File types 2. File attributes 3. File operations | C4 | BTL3 | **13** | |
| 6 | Explain the file allocation methods. | C4 | BTL3 | **8** | |
| 7 | Explain the role of Access Matrix for protection in files. | C4 | BTL4 | **8** | |
| 8 | Write in detail the security measures taken in file system? | C4 | BTL4 | **8** | |
| 9 | Explain the allocation of frames in detail. | C4 | BTL3 | **8** | |
| 10 | Explain the different file access methods in detail. | C4 | BTL3 | **8** | |
| 11 | Describe the two level and acyclic graph schemes for defining the logical structure of a directory | C4 | BTL4 | **8** | |
| 12 | Explain the Linked list and indexed file allocation methods with neat diagram. Mention their advantages and disadvantages. | C4 | BTL4 | **8** | |
| 13 | What are the most common schemes for defining the logical structure of a directory? | C4 | BTL4 | **8** | |
| 14 | Write a brief note on the steps involved in DMA transfer | C4 | BTL3 | **8** | |
| 15 | Explain the data structures supported by kernel I/O system | C4 | BTL3 | **8** | |
| 16 | Why disk scheduling is necessary? Explain the different seek optimization techniques | C4 | BTL4 | **13** | |
| 17 | Explain about RAID structure in disk management with various RAID levels of organization in detail | C4 | BTL4 |  | |
| 18 | Briefly discuss about the various directory structures. | C4 | BTL4 | **13** | |
| 19 | Suppose that a disk drive has 5000 cylinders, numbered 0 through 4999. The drive is serving a request at cylinder 143. The queue of pending requests, in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the head position what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms? FCFS, SSTF, SCAN, LOOK, CSCAN C-LOOK. Explain the pros and cons of all disks scheduling algorithms | C4 | BTL4 | **13** | |
| 20 | Suppose that a disk drive has 200 cylinder, numbered 0 to 199. The work queue is: 23,89,132,42,187. Determine the total distance for the following disk scheduling algorithms (i)SCAN (ii) LOOK (iii) C-SCAN (iv) C-LOOK Work Queue : 23,89,132,42,187 There are 200 cylinder numbered from 0 – 199• The disk head stars at number 100• | C4 | BTL4 | **13** | |
| **PART-C (15-Marks)** | | **CO** | **BT Level** | | **Marks** |
| 1 | Explain the different disk scheduling algorithms with examples. | C4 | BTL3 | | **15** |
| 2 | Explain directory subsystem   1. Explain Linked File Allocation method 2. Explain the issues in designing a file system. 3. Explain the various file directory structures. | C4 | BTL4 | | **15** |
| 3 | On a disk with 200 cylinders, numbered 0 to 199, compute the number of tracks the disk arm must move to satisfy the entire request in the disk queue. Assume the last request received was at truck 100. The queue in FIFO order contains requests for the following tracks. 55, 58, 39, 18, 90, 160, 150, 38, 184. Perform the computation to find the seek time for the following disk scheduling algorithms. (i) FCFS (ii)SSTF (iii) SCAN (iv) C-SCAN (v)LOOK | C4 | BTL4 | | **15** |
| 4 | On a disk with 1000 cylinders, numbers 0 to 999, Compute the number of tracks the disk arm must move to satisfy the entire request in the disk queue. Assume the last received was at track 345 and the head is moving towards track 0.The queue in FIFO order contains requests for the following tracks. 123,874,692,475,105 and 376.Find the seek length for the following scheduling algorithm. (1) SSTF (2) LOOK (3) CSCAN | C4 | BTL4 | | **15** |
| 5 | Consider a disk queue with requests for I/O to blocks on cylinders 93,183, 37,122, 14, 124, 65, 67 If the disk head is start at 53, then find out the total head movement with respect to FCFS,SSTF, SCAN,C-SCAN and LOOK scheduling. | C4 | BTL4 | | **15** |
| **UNIT-V:** VIRTUAL MACHINES AND MOBILE OS | | | | | |
| Virtual Machines – History, Benefits and Features, Building Blocks, Types of Virtual Machines and their Implementations, Virtualization and Operating-System Components; Mobile OS - iOS and Android. | | | | | |
| **PART-A (2-Marks)** | | | | | |
| **S.NO** | **QUESTIONS** | **CO** | **RBT LEVEL** | | |
| 1 | What is Virtual Machine? | C5 | BTL2 | | |
| 2 | List advantage of Virtual Machine? | C5 | BTL1 | | |
| 3 | What are all the disadvantages of Virtual Machine? | C5 | BTL1 | | |
| 4 | List features of Virtual Machine? | C5 | BTL1 | | |
| 5 | What is virtualization? | C5 | BTL2 | | |
| 6 | What are all the types of Virtual Machines | C5 | BTL2 | | |
| 7 | Point out the purpose of using virtualization | C5 | BTL2 | | |
| 8 | Why Virtualization is required? | C5 | BTL2 | | |
| 9 | What is CPU scheduling | C5 | BTL2 | | |
| 10 | What is memory management? | C5 | BTL1 | | |
| 11 | List the services available in iOS. | C5 | BTL1 | | |
| 12 | How are iOS and Android similar? How are they different? | C5 | BTL2 | | |
| 13 | Describe some challenges of designing OS for mobile device compared with designing OS for traditional PC’s | C5 | BTL2 | | |
| 14 | List the disadvantages of Android | C5 | BTL1 | | |
| 15 | List the advantages of Android | C5 | BTL1 | | |
| 16 | What is a mobile operating system? | C5 | BTL1 | | |
| 17 | What is media layer in iOS? | C5 | BTL2 | | |
| 18 | What is iOS SDK? | C5 | BTL2 | | |
| 19 | What is Android? | C5 | BTL2 | | |
| 20 | Which layer of iOS contains fundamental system services for apps | C5 | BTL2 | | |
| **PART-B (13- Marks or 8-Marks)** | | **CO** | **BT Level** | **Marks** | |
| 1 | Discuss about History of Virtual machine. | C5 | BTL3 | **13** | |
| 2 | Explain about Benefits and Features of Virtual machine | C5 | BTL3 | **13** | |
| 3 | Explain in detail about virtualization with neat sketch. | C5 | BTL3 | **8** | |
| 4 | Explain in detail about Building Blocks OF Virtual machine | C5 | BTL4 | **13** | |
| 5 | Discuss about the steps involved in the installation of a Virtualization | C5 | BTL4 | **13** | |
| 6 | Briefly discuss about Live migration of a guest between two servers. | C5 | BTL3 | **13** | |
| 7 | Explain about Operating-System Components | C5 | BTL3 | **8** | |
| 8 | Describe the benefits of virtualization. | C5 | BTL4 | **13** | |
| 9 | Explain types of Virtual Machines | C5 | BTL4 | **13** | |
| 10 | Write short notes virtualization with neat sketch. | C5 | BTL3 | **8** | |
| 11 | What are all the security and privacy features of Apple iOS? | C5 | BTL3 | **8** | |
| 12 | Explain in detail about Mobile OS | C5 | BTL4 | **13** | |
| 13 | Explain in detail about Android operating System | C5 | BTL4 | **13** | |
| 14 | Explain the components of iOS | C5 | BTL4 | **13** | |
| 15 | Explain the architecture of iOS. Discuss the media and service layers clearly. | C5 | BTL4 | **13** | |
| 16 | With frame work explain the working function of android operating system architecture | C5 | BTL3 | **8** | |
| 17 | List the Platforms of Mobile OS? | C5 | BTL4 | **8** | |
| 18 | Compare the feature of iOS and android | C5 | BTL4 | **8** | |
| 19 | Explain the concepts of iOS | C5 | BTL3 | **13** | |
| 20 | Discuss about Android Applications. | C5 | BTL4 | **8** | |
| **PART-C (15-Marks)** | | **CO** | **BT Level** | | **Marks** |
| 1 | Explain the concepts of Virtualization and Operating-System Components | C5 | BTL3 | | **15** |
| 2 | Explain about Virtual Machines and its types. | C5 | BTL4 | | **15** |
| 3 | Explain the architecture of iOS and its components. | C5 | BTL3 | | **15** |
| 4 | With frame work explain the working function of android operating system architecture. Compare the feature of ioS and android. | C5 | BTL4 | | **15** |
| 5 | Explain in detail about Android operating System | C5 | BTL3 | | **15** |