SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

RAMAPURAM CAMPUS, BHARATHISALAI, RAMAPURAM, CHENNAI - 600089

**FACULTY OF ENGINEERING AND TECHNOLOGY**

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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**QUESTION BANK**

DEGREE / BRANCH: B.TECH-CSE

IV SEMESTER

**18CSC205J / OPERATING SYSTEMS**

2018 Regulation

Academic Year 2021-2022 EVEN SEMESTER

# SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

**RAMAPURAM CAMPUS, BHARATHI SALAI, RAMAPURAM, CHENNAI-600089**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**QUESTIONBANK**

**SUBJECT : 18CSC205J/Operating Systems**

**SEM/YEAR: II/IV**

**Course Outcomes**

CLO-1 : Identify the need of an Operating system

CLO-2 : Know the Process management functions of an Operating system

CLO-3 : Understand the need of Memory Management functions of an Operating system

CLO-4 : Find the significance of Device management role of an Operating system

CLO-5 : Recognize the essentials of File Management part of an Operating system

CLO-6 :Gain an insight of Importance of an Operating system through practical

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| **UNIT I** | | | |
| Operating System Objectives and functions - Gaining the role of Operating systems - The evolution of operating system, Major Achievements - Understanding the evolution of Operating systems from early batch processing systems to modern complex systems - Process Concept– Processes, PCB - Understanding the Process concept and Maintenance of PCB by OS -Threads – Overview and its Benefits - Understanding the importance of threads - Process Scheduling : Scheduling Queues, Schedulers, Context switch - Understanding basics of Process Scheduling - Operations on Process – Process creation, Process termination - Understanding the system calls – fork(),wait(),exit() - Inter Process communication : Shared Memory, Message Passing ,Pipe() -Understanding the need for IPC - Process synchronization: Background, Critical section Problem - Understanding the race conditions and the need for the Process synchronization | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | A process is selected from the \_\_\_\_\_\_ queue by the \_\_\_\_\_\_\_\_ scheduler, to be executed. a) blocked, short term b) wait, long term **c) ready, short term** d) ready, long term | CO1 | BT1 |
| **2** | The switching of the CPU from one process or thread to another is called : a) process switch b) task switch c) context switch **d) All of these** | CO1 | BT1 |
| **3** | Dispatch latency is : a) the speed of dispatching a process from running to the ready state b) the time of dispatching a process from running to ready state and keeping the CPU idle **c) the time to stop one process and start running another one** d) None of these | CO1 | BT1 |
| **4** | In Unix, Which system call creates the new process? **a) fork** b) create c) new d) none of the mentioned | CO1 | BT1 |
| **5** | The processes that are residing in main memory and are ready and waiting to execute are kept on a list called a) job queue **b) ready queue** c) execution queue d) process queue | CO1 | BT1 |
| **6** | The interval from the time of submission of a process to the time of completion is termed as a) waiting time **b) turnaround time** c) response time  d) throughput | CO1 | BT1 |
| **7** | To access the services of the operating system, the interface is provided by the \_\_\_\_\_\_\_\_\_\_\_ a) Library **b) System calls** c) Assembly instructions d) API | CO1 | BT1 |
| **8** | In priority scheduling algorithm **a) CPU is allocated to the process with highest priority**  b) CPU is allocated to the process with lowest priority c) equal priority processes can not be scheduled   d) none of the mentioned | CO1 | BT1 |
| **9** | If a process fails, most operating system write the error information to a \_\_\_\_\_\_ a) new file b) another running process **c) log file** d) none of the mentioned | CO1 | BT1 |
| **10** | CPU scheduling is the basis of \_\_\_\_\_\_\_\_\_\_\_\_. a) multiprocessor systems **b) multiprogramming operating systems** c) larger memory sized systems d) None of these | CO1 | BT1 |
| **11** | With multiprogramming, \_\_\_\_\_\_ is used productively. **a) time** b) space c) money d) All of these | CO1 | BT1 |
| **12** | The two steps of a process execution are : (choose two) **a) I/O Burst b) CPU Burst** c) Memory Burst d) OS Burst | CO1 | BT1 |
| **13** | In the following cases non – preemptive scheduling occurs : (Choose two) a) When a process switches from the running state to the ready state **b) When a process goes from the running state to the waiting state** c) When a process switches from the waiting state to the ready state **d) When a process terminates** | CO1 | BT1 |
| **14** | In a memory mapped input/output : a) the CPU uses polling to watch the control bit constantly, looping to see if device is ready **b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available** c) the CPU receives an interrupt when the device is ready for the next byte d) the CPU runs a user written code and does accordingly | CO1 | BT1 |
| **15** | In a programmed input/output(PIO) : **a) the CPU uses polling to watch the control bit constantly, looping to see if device is ready** b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available c) the CPU receives an interrupt when the device is ready for the next byte d) the CPU runs a user written code and does accordingly | CO1 | BT1 |
| **16** | In an interrupt driven input/output : a) the CPU uses polling to watch the control bit constantly, looping to see if device is ready b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available **c) the CPU receives an interrupt when the device is ready for the next byte** d) the CPU runs a user written code and does accordingly | CO1 | BT1 |
| **17** | Which one of the following cannot be scheduled by the kernel? a) kernel level thread **b) user level thread** c) process d) none of the mentioned | CO1 | BT1 |
| **18** | The objective of multi-programming is to : (choose two) a) Have some process running at all times b) Have multiple programs waiting in a queue ready to run c) To minimize CPU utilization **d) To maximize CPU utilization** | CO1 | BT1 |
| **19** | Which of the following do not belong to queues for processes? a) Job Queue **b) PCB queue** c) Device Queue d) Ready Queue | CO1 | BT1 |
| **20** | When the process issues an I/O request : **a) It is placed in an I/O queue** b) It is placed in a waiting queue c) It is placed in the ready queue d) It is placed in the Job queue | CO1 | BT1 |
| **21** | What is a trap/exception ? a) hardware generated interrupt caused by an error **b) software generated interrupt caused by an error** c) user generated interrupt caused by an error d) None of these | CO1 | BT1 |
| **22** | What is an ISR ? a) Information Service Request b) Interrupt Service Request **c) Interrupt Service Routine** d) Information Service Routine | CO1 | BT1 |
| **23** | Which facility dynamically adds probes to a running system, both in user processes and in the kernel? **a) Dtrace**   b) Dlocate  c) Dmap   d) Dadd | CO1 | BT1 |
| **24** | Which one of the following is not a real time operating system? a) VxWorks   b) Windows CE  c) RTLinux   **d) Palm OS** | CO1 | BT1 |
| **25** | The OS X has a) monolithic kernel **b) hybrid kernel** c) microkernel d) monolithic kernel with modules | CO1 | BT1 |
| **PART B (4 Marks)** | | | |
| **1** | Illustrate the factors that usually determine the degree of Multi Programming   1. The number of Programs residing in Primary memory. 2. Passing of the control of the CPU rapidly between these programs. 3. Protection of user process from one another. | CO1 | BT2 |
| **2** | What are the Benefits of Multi Programming?   1. Improves the System Performance. 2. Allows Time Sharing. 3. Supports multiple simultaneous interactive users | CO1 | BT1 |
| **3** | What are the types of memory?  i) Internal Processor Memory  ii) Primary or Main Memory  iii) Secondary/Auxiliary/Backing Store are the types of memory. | CO1 | BT1 |
| **4** | What is Memory?  A Memory is the place for storage of data & information (or) it can be Defined as the work area of the computer where the microprocessor finds its data & instructions while the computer is working. | CO1 | BT1 |
| **5** | Explain Off-Line Processing and On-Line Processing?               Rather than the CPU reading directly from the input, copying the content into CPU AND PROCESS.  Transferring the contents from the input directly on to the CPU and transferring the Processed contents onto the printer is On-Line | CO1 | BT2 |
| **6** | Give examples of Real Time Application  Ex’s are   1. Flight Control 2. Real Time Simulation 3. Military Application 4. Petroleum Refinery 5. Process Control etc. | CO1 | BT1 |
| **7** | Define Real Time Systems .  It is another form of OS which are used in environments where a large number of events mostly external to the computer system must be accepted and processed in a short time or within certain deadlines. | CO1 | BT1 |
| **8** | What is Time Sharing?  Time Sharing ( or Multi tasking) is a logical extension of Multi Programming.  It is a form of Multi Programmed OS which operates in an interactive mode with Quick response time | CO1 | BT1 |
| **9** | What is Asymmetric Multi Processing?  It is one in which each processor is assigned a specific task.  A Master Processor controls the system and the other Processors are allocated work by the Master Processor. | CO1 | BT1 |
| **10** | What is the advantage of Multi Processing Systems?  A Multi Processing System is one in which there are more than one CPU, interleaved with each other.  So it helps in improving the amount of work done. | CO1 | BT1 |
| **11** | How does a process differ from a job?  A process is an active entity with a program counter specifying the next instructions to execute and a set to associated resources, whereas a batchSystem executes jobs.(which is a collection of processes). | CO1 | BT1 |
| **12** | What are the information contained in a PCB?                    A PCB contains pieces of information associated with a specific process,                    Namely   1. Identifier 2. process state 3. program counter 4. Context data 5. CPU scheduling information 6. Memory management information 7. Accounting information 8. I/O status information | CO1 | BT1 |
| **13** | What are the operations on process?  a.create  a process  b.destroy a process  c.suspend a process  d.resume a process  e.change the priority of a process  f.block a process  g.wakeup  a process  h.dispatch a process  i.enable a process to communicate with another | CO1 | BT1 |
| **14** | Elaborate the function of the ready queue?  The ready queue stores threads that aren't currently running, that are capable of resuming execution. There may be several ready queues for each priority level, depending on the scheduling algorithm. The scheduler consults the ready queue to determine which process/thread to run next. As the name suggests, the ready queue is a *queue,*in order to schedule fairly. | CO1 | BT1 |
| **15** | What is the relationship between threads and processes?               A processes is a container for threads, which has it's own memory space. A process may contain one or more threads, which share that memory space, all of the file descriptors and other attributes. The threads are the units of execution  within the process, they posess a register set, stack, program counter, and scheduling attributes - *per thread.* | CO1 | BT1 |
| **16** | What is the function of a process control block?.                   A (PCB) contains many pieces of information associated with a specific                   Process. It serves as the repository for any information that may vary                   From process to process. | CO1 | BT1 |
| **17** | What are the various process states?                    The various process states are   1. New 2. Ready 3. Running 4. Blocked 5. Exit. | CO1 | BT1 |
| **18** | How does a process differ from a job?  A process is an active entity with a program counter specifying the next instructions to execute and a set to associated resources, whereas a batchSystem executes jobs.(which is a collection of processes | CO1 | BT1 |
| **19** | What are the main functions of the kernel?  To provide mechanism for   1. creation and deletion of processes 2. inter process communication 3. synchronization of processes. | CO1 | BT1 |
| **20** | Write the functions of an OS .        (i)     Memory Management.        (ii)    Processor management.        (iii)    Interrupt Handling.        (iv)    Accounting.        (v)    Automatic job sequencing.        (vi)  Management and control of  I/O devices | CO1 | BT1 |
| **PART C (12 Marks)** | | | |
| **1** | Explain  the following                   i) The basic elements of a computer system                   ii)Processor register | CO1 | BT2 |
| **2** | Explain the essential properties of the following operating systems.                  a)Batch                        b)Interactive                  c)Time sharing           d)Real Time                  e)Network                  f)parallel                  g)Distributed             h)clustered | CO1 | BT2 |
| **3** | Explain  the following                   i) OS control structures                   ii)Process control structures | CO1 | BT2 |
| **4** | i)Explain in detail the various reasons involved in process creation and termination.  ii)Compare mode switching and process switching. | CO1 | BT2 |
| **5** | Explain in detail the single thread and multithread process model with diagrams | CO1 | BT2 |
| **6** | Compare user level and kernel level threads with necessary diagrams. | CO1 | BT1 |
| **7** | Explain how micro kernel architecture differs from layered kernel architecture. | CO1 | BT2 |
| **8** | With neat diagram explain the five states involved in process model. | CO1 | BT1 |
| **9** | Explain in detail                   i)how interrupts are processed.                   ii)how multiple interrupts are handled. | CO1 | BT2 |
| **10** | Explain the different I/O communication techniques | CO1 | BT2 |

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| **UNIT II** | | | |
| PROCESS SYNCHRONIZATION : Peterson’s solution, Synchronization Hardware, Understanding the two-process solution and the benefits of the synchronization hardware, Process synchronization: Semaphores, usage, implementation, Gaining the knowledge of the usage of the semaphores for the Mutual exclusion mechanisms, Classical Problems of synchronization – Readers writers problem, Bounded Buffer problem, Good understanding of synchronization mechanisms, Classical Problems of synchronization – Dining Philosophers problem (Monitor ), Understanding the synchronization of limited resources among multiple processes, CPU SCHEDULING : FCFS,SJF,Priority, Understanding the scheduling techniques, CPU Scheduling: Round robin, Multilevel queue Scheduling, Multilevel feedback Scheduling, Understanding the scheduling techniques, Real Time scheduling: Rate Monotonic Scheduling and Deadline Scheduling, Understanding the real time scheduling, DEADLOCKS: Necessary conditions, Resource allocation graph, Deadlock prevention methods, Understanding the deadlock scenario, Deadlocks :Deadlock Avoidance, Detection and Recovery, Understanding the deadlock avoidance, detection and recovery mechanisms | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | 1. Which process can be affected by other processes executing in the system? **a) cooperating process** b) child process c) parent process d) init process | CO2 | BT1 |
| **2** | If a process is executing in its critical section, then no other processes can be executing in their critical section. What is this condition called? **a) mutual exclusion** b) critical exclusion c) synchronous exclusion d) asynchronous exclusion | CO2 | BT1 |
| **3** | Which one of the following is a synchronization tool? a) thread b) pipe **c) semaphore** d) socket | CO2 | BT1 |
| **4** | A semaphore is a shared integer variable \_\_\_\_\_\_\_\_\_\_ **a) that can not drop below zero** b) that can not be more than zero c) that can not drop below one d) that can not be more than one | CO2 | BT2 |
| **5** | Mutual exclusion can be provided by the \_\_\_\_\_\_\_\_\_\_ a) mutex locks b) binary semaphores **c) both mutex locks and binary semaphores** d) none of the mentioned | CO2 | BT1 |
| **6** | When high priority task is indirectly preempted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called \_\_\_\_\_\_\_\_\_\_ **a) priority inversion** b) priority removal c) priority exchange d) priority modification | CO2 | BT1 |
| **7** | Process synchronization can be done on \_\_\_\_\_\_\_\_\_\_ a) hardware level b) software level **c) both hardware and software level** d) none of the mentioned | CO2 | BT1 |
| **8** | Peterson solution is restricted to ----------- process that alternate execution between their critical section and remainder sections.  a)one **b) two** c) three d) four | CO2 | BT2 |
| **9** | The wait operation of the semaphore basically works on the basic \_\_\_\_\_\_\_ system call. a) stop() **b) block()** c) hold() d) wait() | CO2 | BT1 |
| **10** | The signal operation of the semaphore basically works on the basic \_\_\_\_\_\_\_ system call. a) continue() **b) wakeup()** c) getup() d) start() | CO2 | BT2 |
| **11** | What are the two kinds of semaphores? a) mutex & counting **b) binary & counting** c) counting & decimal d) decimal & binary | CO2 | BT2 |
| **12** | The bounded buffer problem is also known as \_\_\_\_\_\_\_\_\_\_\_\_ a) Readers – Writers problem b) Dining – Philosophers problem **c) Producer – Consumer problem**  d) Critical Section Problem | CO2 | BT2 |
| **13** | The dining – philosophers problem will occur in case of \_\_\_\_\_\_\_\_\_\_\_\_ **a) 5 philosophers and 5 chopsticks** b) 4 philosophers and 5 chopsticks c) 3 philosophers and 5 chopsticks d) 6 philosophers and 5 chopsticks | CO2 | BT2 |
| **14** | In the bounded buffer problem, there are the empty and full semaphores that \_\_\_\_\_\_\_\_\_\_\_\_ **a) count the number of empty and full buffers** b) count the number of empty and full memory spaces c) count the number of empty and full queues d) count the number of empty and full process | CO2 | BT1 |
| **15** | To ensure difficulties do not arise in the readers – writers problem \_\_\_\_\_\_\_ are given exclusive access to the shared object. a) readers **b) writers** c) readers and writers d) either reader or writers | CO2 | BT2 |
| **16** | Which module gives control of the CPU to the process selected by the short-term scheduler? **a) dispatcher** b) interrupt c) scheduler d) none of the mentioned | CO2 | BT1 |
| **17** | The processes that are residing in main memory and are ready and waiting to execute are kept on a list called \_\_\_\_\_\_\_\_\_\_\_\_\_ a) job queue **b) ready queue** c) execution queue d) process queue | CO2 | BL1 |
| **18** | The interval from the time of submission of a process to the time of completion is termed as \_\_\_\_\_\_\_\_\_\_\_\_ a) waiting time **b) turnaround time** c) response time d) throughput | CO2 | BT1 |
| **19** | Which scheduling algorithm allocates the CPU first to the process that requests the CPU first? **a) first-come, first-served scheduling** b) shortest job scheduling c) priority scheduling d) none of the mentioned | CO2 | BT1 |
| **20** | In priority scheduling algorithm \_\_\_\_\_\_\_\_\_\_\_\_ **a) CPU is allocated to the process with highest priority** b) CPU is allocated to the process with lowest priority c) Equal priority processes can not be scheduled d) None of the mentioned | CO2 | BT2 |
| **21** | In priority scheduling algorithm, when a process arrives at the ready queue, its priority is compared with the priority of \_\_\_\_\_\_\_\_\_\_\_\_ a) all process **b) currently running process** c) parent process d) init process | CO2 | BT2 |
| **22** | Process are classified into different groups in \_\_\_\_\_\_\_\_\_\_\_\_ a) shortest job scheduling algorithm b) round robin scheduling algorithm c) priority scheduling algorithm **d) multilevel queue scheduling algorithm** | CO2 | BT1 |
| **23** | What is a reusable resource? **a) that can be used by one process at a time and is not depleted by that use** b) that can be used by more than one process at a time c) that can be shared between various threads d) none of the mentioned | CO2 | BT2 |
| **24** | Which one of the following is the deadlock avoidance algorithm? **a) banker’s algorithm** b) round-robin algorithm c) elevator algorithm d) karn’s algorithm | CO2 | BT1 |
| **25** | What is the drawback of banker’s algorithm? a) in advance processes rarely know how much resource they will need b) the number of processes changes as time progresses c) resource once available can disappear **d) all of the mentioned** | CO2 | BT1 |
| **26** | A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_ a) deadlock **b) starvation** c) inversion d) aging | CO2 | BT1 |
| **27** | To avoid deadlock \_\_\_\_\_\_\_\_\_\_\_\_ **a) there must be a fixed number of resources to allocate** b) resource allocation must be done only once c) all deadlocked processes must be aborted d) inversion technique can be used | CO2 | BT2 |
| **28** | ThThe request and release of resources are \_\_\_\_\_\_\_\_\_\_\_ a) command line statements b) interrupts **c) system calls** d) special programs | CO2 | BT1 |
| **29** | Which among the following is helpful in CPU scheduling decisions?  a. When a process switches from thewaiting state to the running state  b. When a process switches from the ready state to the running state  **c.When a process switches from the waiting state to the ready state**  d.When a process begins | CO2 | BT1 |
| **30** | The circular wait condition can be prevented by \_\_\_\_\_\_\_\_\_\_\_\_  **a) defining a linear ordering of resource types**  b) using thread  c) using pipes  d) using both thread and pipes. | CO2 | BT1 |
| **PART B (4 Marks)** | | | |
| **1** | What is busy waiting? | CO2 | BT2 |
| **2** | Write short notes on turn around time, waiting time and response time | CO2 | BT1 |
| **3** | What is a binary semaphore? | CO2 | BT1 |
| **4** | What is the difference between synchronization and mutual exclusion? | CO2 | BT2 |
| **5** | List the Coffman’s conditions that lead to a deadlock. | CO2 | BT2 |
| **6** | List the three requirements that must be satisfied by critical section problem. | CO2 | BT1 |
| **7** | Write short notes on semaphore | CO2 | BT1 |
| **8** | Illustrate about Petersons solution | CO2 | BT2 |
| **9** | Examine about mutex locks | CO2 | BT1 |
| **10** | Discuss about priority inversion with an example | CO2 | BT2 |
| **11** | Define CPU Scheduling. | CO2 | BT1 |
| **12** | What is Preemptive and Non - Preemptive scheduling? | CO2 | BT1 |
| **13** | What are the various scheduling criteria for CPU Scheduling? | CO2 | BT1 |
| **14** | Define Entry Section and Exit Section. | CO2 | BT1 |
| **15** | Give two hardware instructions and their definitions which can be used for implementing Mutual Exclusion. | CO2 | BT2 |
| **16** | How can we say the First Come First Served scheduling algorithm is Non Preemptive? | CO2 | BT2 |
| **17** | Differentiate Long Term Scheduler and Short Term Scheduler | CO2 | BT1 |
| **18** | What are a Safe State and an Unsafe State? | CO2 | BT1 |
| **19** | What is a Gantt Chart? | CO2 | BT1 |
| **20** | Define Request Edge and Assignment Edge. | CO2 | BT1 |
| **PART C (12 Marks)** | | | |
| **1** | Outline a solution using semaphores to solve dinning philosopher problem. | CO2 | BT2 |
| **2** | Compute non-preemptive SJF scheduling algorithm   |  |  |  | | --- | --- | --- | | Process | Arrival time | Burst time | | P1 | 0 | 7 | | P2 | 2 | 4 | | P3 | 4 | 1 | | P4 | 5 | 4 | | P5 | 3 | 4 | | CO2 | BT3 |
| **3** | Consider the following set of processes with the length of the CPU-burst time in given  ms:   |  |  |  | | --- | --- | --- | | Process | Arrival time | Burst time | | P1 | 8 | 0 | | P2 | 4 | 1 | | P3 | 9 | 2 | | P4 | 5 | 3 | | P5 | 3 | 4 |   Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, priority and RR (quantum=2) scheduling. Also calculate waiting time and turnaround time for each scheduling algorithms. | CO2 | BT3 |
| **4** | Show how wait () and signal() semaphore operations could be implemented in multiprocessor environments, using Test and Set instructions. The solution should exhibit minimal busy waiting. Develop pseudo code for implementing operations. | CO2 | BT2 |
| **5** | Explain in detail about multilevel queue scheduling | CO2 | BT1 |
| **6** | Describe about multilevel feedback scheduling | CO2 | BT1 |
| **7** | With an example explain about resource allocation graph | CO2 | BT1 |
| **8** | Illustrate Bankers algorithm with an example | CO2 | BT2 |
| **9** | Describe Deadlock prevention in detail. | CO2 | BT2 |
| **10** | Explain the methods for handling deadlocks. | CO2 | BT2 |

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| **UNIT III** | | | | | |
| MEMORY MANAGEMENT: Memory Management: Logical Vs Physical address space, Swapping and understanding the basics of Memory management Contiguous Memory allocation – Fixed and Dynamic partition Getting to know about Partition memory management and issues: Internal fragmentation and external fragmentation problems Strategies for selecting free holes in Dynamic partition Understanding the allocation strategies with examples Paged memory management Understanding the Paging technique.PMT hardware mechanism Structure of Page Map Table Understanding the components of PMT Example : Intel 32 bit and 64 –bit Architectures Understanding the Paging in the Intel architectures Example : ARM Architectures Understanding the Paging with respect to ARM Segmented memory management Understanding the users view of memory with respect to the primary memory Paged segmentation Technique Understanding the combined scheme for efficient management | | | | | |
| **PART-A (Multiple Choice Questions)** | | | | | |
| **Q.**  **No** | **Questions** | | **Course Outcome** | | **Competence**  **BT Level** |
| **1** | 1. CPU fetches the instruction from memory according to the value of \_\_\_\_\_\_\_\_\_\_\_\_ **a) program counter** b) status register c) instruction register d) program status word | | CO3 | | BT1 |
| **2** | A memory buffer used to accommodate a speed differential is called \_\_\_\_\_\_\_\_\_\_\_\_ a) stack pointer **b) cache** c) accumulator d) disk buffer | | CO3 | | BT1 |
| **3** | Which one of the following is the address generated by CPU? a) physical address b) absolute address **c) logical address** d) none of the mentioned | | CO3 | | BT2 |
| **4** | What is Address Binding? a) going to an address in memory b) locating an address with the help of another address c) binding two addresses together to form a new address in a different memory space **d) a mapping from one address space to another** | | CO3 | | BT1 |
| **5** | Binding of instructions and data to memory addresses can be done at \_\_\_\_\_\_\_\_\_\_\_\_ a) Compile time b) Load time c) Execution time **d) All of the mentioned** | | CO3 | | BT1 |
| **6** | If the process can be moved during its execution from one memory segment to another, then binding must be \_\_\_\_\_\_\_\_\_\_\_\_ **a) delayed until run time** b) preponed to compile time c) preponed to load time d) none of the mentioned | | CO3 | | BT2 |
| **7** | The main memory accommodates \_\_\_\_\_\_\_\_\_\_\_\_ **a) operating system** b) cpu c) user processes d) all of the mentioned | | CO3 | | BT1 |
| **8** | In contiguous memory allocation \_\_\_\_\_\_\_\_\_\_\_\_ **a) each process is contained in a single contiguous section of memory** b) all processes are contained in a single contiguous section of memory c) the memory space is contiguous d) none of the mentioned | | CO3 | | BT1 |
| **9** | A solution to the problem of external fragmentation is \_\_\_\_\_\_\_\_\_\_\_\_ **a) compaction** b) larger memory space c) smaller memory space d) none of the mentioned | | CO3 | | BT1 |
| **10** | Another solution to the problem of external fragmentation problem is to \_\_\_\_\_\_\_\_\_\_\_\_ **a) permit the logical address space of a process to be noncontiguous** b) permit smaller processes to be allocated memory at last c) permit larger processes to be allocated memory at last d) all of the mentioned | | CO3 | | BT1 |
| **11** | Physical memory is broken into fixed-sized blocks called \_\_\_\_\_\_\_\_ **a) frames** b) pages c) backing store d) none of the mentioned | | CO3 | | BT1 |
| **12** | Every address generated by the CPU is divided into two parts. They are \_\_\_\_\_\_\_\_\_\_\_\_ a) frame bit & page number **b) page number & page offset** c) page offset & frame bit d) frame offset & page offset | | CO3 | | BT2 |
| **13** | If a page number is not found in the TLB, then it is known as a \_\_\_\_\_\_\_\_\_\_\_\_ **a) TLB miss** b) Buffer miss c) TLB hit d) All of the mentioned | | CO3 | | BT1 |
| **14** | An \_\_\_\_\_\_ uniquely identifies processes and is used to provide address space protection for that process. a) address space locator **b) address space identifier** c) address process identifier d) none of the mentioned | | CO3 | | BT2 |
| **15** | Each entry in a translation lookaside buffer (TLB) consists of \_\_\_\_\_\_\_\_\_\_\_\_ **a) key** b) value c) bit value d) constant | | CO3 | | BT1 |
| **16** | In segmentation, each address is specified by \_\_\_\_\_\_\_\_\_\_\_\_ **a) a segment number & offset** b) an offset & value c) a value & segment number d) a key & value | | CO3 | | BT2 |
| **17** | In paging the user provides only \_\_\_\_\_\_\_\_ which is partitioned by the hardware into \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_ a) one offset, page number, address b) page number, offset, address  **c) one address, page number, offset** d) none of the mentioned | | CO3 | | BT1 |
| **18** | Each entry in a segment table has a \_\_\_\_\_\_\_\_\_\_\_\_ **a) segment base** b) segment peak c) segment value d) none of the mentioned | | CO3 | | BT1 |
| **19** | Which of the following is/are the requirements of memory management. i) Relocation   ii) Protection   iii) Sharing  iv) Memory organization **A) i, ii and iii only** B) ii, iii and iv only C) i, iii and iv only D) All i, ii, iii and iv | | CO3 | | BT1 |
| **20** | The ……………… requirement must be satisfied by the processor rather than the operating system because the operating system cannot anticipate all of the memory references that the program will make. A) memory relocation **B) memory protection** C) memory sharing D) memory organization | | CO3 | | BT1 |
| **21** | The memory management system must, therefore, allow controlled access to …………… areas of memory without compromising essential protection. A) relocated B) protected **C) shared** D) organized | | CO3 | | BT1 |
| **22** | Main memory in a computer system is ………………. as a linear or one dimensional, address space, consisting of a sequence of bytes or words. A) relocated B) protected C) shared **D) organized** | | CO3 | | BT2 |
| **23** | In …………… there is no internal fragmentation and is a more efficient use of main memory. A) Fixed partitioning **B) Dynamic partitioning** C) Virtual memory paging D) Simple segmentation | | CO3 | | BT1 |
| **24** | Among all memory management techniques …………….. is simple to implement little operating system overhead. **A) Fixed partitioning** B) Simple Paging C) Virtual memory paging D) Simple segmentation | | CO3 | | BT2 |
| **25** | In ………….. there is not necessary to load all of the segments of a process and non-resident segments that are needed are brought in later automatically. A) Fixed partitioning B) Simple Paging **C) Virtual memory segmentation** D) Simple segmentation | | CO3 | | BT1 |
| **26** | A process may be loaded into a partition of equal or greater size in ………………. of memory. **A) Fixed partitioning** B) Simple Paging C) Virtual memory paging D) Simple segmentation | | CO3 | | BT2 |
| **27** | In ……………….., there is an inefficient use of processor due to the need for compaction to counter external fragmentation. A) Fixed partitioning **B) Dynamic partitioning** C) Virtual memory paging D) Simple segmentation | | CO3 | | BT2 |
| **28** | Which of the following is/are the strengths of virtual memory segmentation techniques used in memory management. i) No internal fragmentation ii) A higher degree of multiprogramming iii) More efficient to use of main memory iv) Large virtual address space v) Protection and sharing support A) i, ii, iii and iv only B) i, ii, iii and v only **C) i, ii, iv and v only** D) ii, iii, iv and v only | | CO3 | | BT1 |
| **29** | Consider a computer with 8 Mbytes of main memory and a 128K cache. The cache block size is 4 K. It uses a direct mapping scheme for cache management. How many different main memory blocks can map onto a given physical cache block?   1. 2048 2. 256 3. **64** 4. 8 | | CO3 | | BT1 |
| **30** | The segment base contains the \_\_\_\_\_\_\_\_\_\_\_\_  a) starting logical address of the process  **b) starting physical address of the segment in memory**  c) segment length  d) none of the mentioned | | CO3 | | BT1 |
| **PART B (4 Marks)** | | | | | |
| **1** | How is memory protected in a paged environment? | CO3 | | BT1 | |
| **2** | What is External Fragmentation? | CO3 | | BT1 | |
| **3** | What is the use of Valid-Invalid Bits in Paging? | CO3 | | BT2 | |
| **4** | Explain memory management without swapping or paging | CO3 | | BT1 | |
| **5** | Explain page replacement algorithms | CO3 | | BT2 | |
| **6** | Why page sizes are always power of 2? | CO3 | | BT1 | |
| **7** | List two differences between logical and physical addresses. | CO3 | | BT4 | |
| **8** | Define demand paging in memory management. | CO3 | | BT1 | |
| **9** | What are the steps required to handle a page fault in demand paging? | CO3 | | BT1 | |
| **10** | Tell the significance of LDT and GDT in segmentation. | CO3 | | BT1 | |
| **11** | Explain dynamic loading. | CO3 | | BT2 | |
| **12** | What is Demand Paging? | CO3 | | BT1 | |
| **13** | How the problem of external fragmentation can be solved | CO3 | | BT1 | |
| **14** | Formulate how long a paged memory reference takes if memory reference takes 200 nanoseconds.Assume a paging system with page table stored in memory | CO3 | | BT6 | |
| **15** | Define Address binding. | CO3 | | BT1 | |
| **16** | What is Internal Fragmentation? | CO3 | | BT1 | |
| **17** | What do you mean by Compaction? | CO3 | | BT1 | |
| **18** | What is the difference between user-level instructions and privileged instructions? | CO3 | | BT1 | |
| **19** | What is memory stall? | CO3 | | BT1 | |
| **20** | Define logical address space | CO3 | | BT1 | |
| **PART C (12 Marks)** | | | | | |
| **1** | Elaborate about the free space management on I/O buffering and blocking. | CO3 | | BT6 | |
| **2** | Explain about given memory management techniques. (i) Partitioned allocation (ii) Paging and translation look-aside buffer. | CO3 | | BT5 | |
| **3** | When page faults will occur? Describe the actions taken by operating system during page fault. | CO3 | | BT1 | |
| **4** | Explain about the difference between internal fragmentation and external fragmentation | CO3 | | BT5 | |
| **5** | Why are segmentation and paging sometimes combined into one scheme? | CO3 | | BT1 | |
| **6** | Compare paging with segmentation in terms of the amount of memory required by the address translation structures in order to convert virtual addresses to physical addresses. | CO3 | | BT2 | |
| **7** | Most systems allow programs to allocate more memory to its address space during execution. Data allocated in the heap segments of programs is an example of such allocated memory. What is required to support dynamic memory allocation in the following schemes? | CO3 | | BT1 | |
| **8** | Explain the difference between logical address and physical address. | CO3 | | BT1 | |
| **9** | Define Compaction and explain why it is used. | CO3 | | BT1 | |
| **10** | Define Contiguous Allocation. | CO3 | | BT5 | |

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| **UNIT IV** | | | |
| VIRTUAL MEMORY– Background-Understanding the need of demand paging-VIRTUAL MEMORY – Basic concepts – page fault handling -Understanding , how an OS handles the page faults-Performance of Demand paging-Understanding the relationship of effective access time and the page fault rate-Copy-on write-Understanding the need for Copy-on write -Page replacement Mechanisms: FIFO, Optimal, LRU and LRU approximation Techniques-Understanding the Pros and cons of the page replacement techniques-Counting based page replacement and Page Buffering Algorithms -To know on additional Techniques available for page replacement strategies-Allocation of Frames - Global Vs Local Allocation -Understanding the root cause of the Thrashing-Thrashing, Causes of Thrashing -Understanding the Thrashing -Working set Model-Understanding the working set model for  controlling the Working set Model | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | Virtual memory allows \_\_\_\_\_\_\_\_\_\_\_\_   **a) execution of a process that may not be completely in memory**  b) a program to be smaller than the physical memory  c) a program to be larger than the secondary storage  d) execution of a process without being in physical memory | CO4 | BT 1 |
| **2** | The instruction being executed, must be in \_\_\_\_\_\_\_\_\_\_\_\_  **a) physical memory**  b) logical memory  c) physical & logical memory  d) secondary storage | CO4 | BT 1 |
| **3** | Virtual memory is normally implemented by \_\_\_\_\_\_\_\_  **a) demand paging**  b) buses  c) virtualization  d) queues | CO4 | BT 1 |
| **4** | A page fault occurs when?  a) a page gives inconsistent data  **b) a page cannot be accessed due to its absence from memory**  c) a page is invisible  d) a page is deleted | CO4 | BT 1 |
| **5** | MMU stands for?  a) memory mapping unit  **b) memory management unit**  c) main memory unit  d) memory management unit | CO4 | BT 1 |
| **6** | Which algorithm is based on the argument that the page with the smallest count?  a) Least frequently Used  b) Page Buffering algorithm   **c) Most frequently Used**  d) Least Recently Used | CO4 | BT 1 |
| **7** | The pager concerns with the  **a)entire thread**  b) first page of a process  c) individual page of a process  d) entire process | CO4 | BT 2 |
| **8** | Working set model for [page replacement](https://t4tutorials.com/page-fault-page-replacement-operating-systems-os/) is based on the assumption of  a)globalization  b) random access  c) modularity  **d) locality** | CO4 | BT 1 |
| **9** | The minimum number of frames to be allocated to a process is decided by the \_\_\_\_\_\_\_\_\_\_\_\_  a) the amount of available physical memory  b) operating System  **c) instruction set architecture**  d) CPU | CO4 | BT 2 |
| **10** | \_\_\_\_\_\_\_\_\_ replacement allows each process to only select from its own set of allocated frames.  **a) Local**  b) Universal  c) Global  d) Public | CO4 | BT1 |
| **11** | Thrashing \_\_\_\_\_\_\_ the CPU utilization.  a) increases  b) keeps constant  **c) decreases**  d) stops | CO4 | BT 2 |
| **12** | When the page fault rate is low \_\_\_\_\_\_\_\_\_\_\_\_  a) the turnaround time increases  b) the effective access time increases  **c) the effective access time decreases**  d) turn around time & effective access time increases | CO4 | BT 1 |
| **13** | Which one generates relocatable code if memory location is not known at compile time  **a) Load time**  b) access time  c) Execution time  d) Allocation time | CO4 | BT 1 |
| **14** | System libraries and program code combined by the loader into the binary program image is  **a)Static linking**  b)Dynamic linking  c)Stubs  d)Shared libraries | CO4 | BT 2 |
| **15** | Segment table maps \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ physical addresses  a)1 dimensional  **b)2 dimensional**  c)Multi-dimensional  d)Infinity | CO4 | BT 1 |
| **16** | STLR stands for  **a)Segment-table length register**  b)Segment-table level register  c)Segment-table logic register  d)Segment-table label register | CO4 | BT 2 |
| **17** | Dividing physical memory into fixed-sized blocks called  **a)Frames**  b)Tables  c)Pages  d)segments | CO4 | BT 1 |
| **18** | whenever the [page required to be replaced](https://t4tutorials.com/optimal-page-replacement-memory-management-operating-systems-os/) which algorithm chooses the page that has not been used for the longest period of time?   a) additional reference bit algorithm   **b)**[**least recently used algorithm**](https://t4tutorials.com/least-recently-used-lru-page-replacement-algorithm-in-operating-systems-os/)  c) counting based [page replacement](https://t4tutorials.com/page-fault-page-replacement-operating-systems-os/) algorithm  d) first in first out algorithm | CO4 | BT 1 |
| **19** | Which is combined with base address to define the physical memory address that is sent to the memory unit  **a)Page offset**  b) page table  c) page number  d) frame number | CO4 | BT3 |
| **20** | Which one allows both parent and child processes to initially share the same pages in memory  **a) Copy-on-Write**  b) read on write  c) write and share  d) copy on read | CO4 | BT1 |
| **21** | Which a process selects a replacement frame from the set of all frames. **a) Global replacement** b) Local replacement c) Module replacement d)Block replacement | CO4 | BT3 |
| **22** | A process is copied into the main [memory](https://t4tutorials.com/difference-between-primary-memory-and-secondary-memory/) from the secondary memory a) Swapping b) Paging c) Segmentation **d)**[**Demand paging**](https://t4tutorials.com/demand-paging-and-pager-in-operating-systems/) | CO4 | BT1 |
| **23** | \_\_\_\_\_\_\_\_\_\_ is used to implement virtual memory organisation. a) Page table b) Frame table **c) MMU** d) copy-on-write | CO4 | BT1 |
| **24** | The two memory access problem can be solved by the use of a special fast-lookup hardware cache is  **a)associative memory**  b) logical memory  c)physical & logical memory d)secondary storage | CO4 | BT1 |
| 25 | Main memory can take many cycles, causing a  **a)stall**  b)Swapping  c)Paging  d) Segmentation | CO4 | BT1 |
| **26** | What is the reason for using the LFU page replacement algorithm? **a) an actively used page should have a large reference count** b) a less used page has more chances to be used again c)it is extremely efficient and optimal d) memory usage is low | CO4 | BT1 |
| **27** | A process is thrashing if \_\_\_\_\_\_\_\_\_\_\_\_ a) it spends a lot of time executing, rather than paging **b) it spends a lot of time paging than executing** c) it has no memory allocated to it d) it uses less pages. | CO4 | BT1 |
| **28** | A memory page containing a heavily used variable that was initialized very early and is in constant use is removed, then the page replacement algorithm used is \_\_\_\_\_\_\_\_\_\_\_\_ a) LRU b) LFU **c) FIFO** d) LIFO | CO4 | BT1 |
| **29** | When a program tries to access a page that is mapped in address space but not loaded in physical memory, then \_\_\_\_\_\_\_\_\_\_\_\_ a) segmentation fault occurs b) fatal error occurs **c) page fault occurs** d) no error occurs | CO4 | BT1 |
| **30** | The base register is also known as the \_\_\_\_\_\_\_\_\_\_\_\_ a) basic register b) regular register **c) relocation register** d) delocation register | CO4 | BT3 |
| **PART B (4 Marks)** | | | |  |
| **1** | Define Swapping. what is its purpose? | CO4 | BT 1 |
| **2** | What is the basic method of Segmentation? | CO4 | BT 1 |
| **3** | Explain fragmentation and its types? | CO4 | BT 1 |
| **4** | What is the basic approach of Page Replacement? | CO4 | BT 1 |
| **5** | What is virtual memory? Mention its advantages | CO4 | BT 2 |
| **6** | Explain about contiguous memory allocation? | CO4 | BT 1 |
| **7** | Explain about advantages and disadvantages of paging? | CO4 | BT 3 |
| **8** | Differentiate local and global page replacement algorithm. | CO4 | BT 2 |
| **9** | Explain the need of copy-on-write ? | CO4 | BT 2 |
| **10** | Define dynamic loading. | CO4 | BT 3 |
| **11** | What is hit ratio and effective access time? | CO4 | BT 2 |
| **12** | Define page offset and page number | CO4 | BT 2 |
| **13** | Explain segment tables and its entries? | CO4 | BT 3 |
| **14** | What is compaction and need of compaction? | CO4 | BT 2 |
| **15** | What is page fault and page hit? | CO4 | BT 2 |
| **16** | What is a working set model? | CO4 | BT 3 |
| **17** | What are the essential content(s) in each entry of a page table? | CO4 | BT 2 |
| **18** | Define logical and physical address spaces? | CO4 | BT 2 |
| **19** | Draw the structure of page table | CO4 | BT 2 |
| **20** | Define: STBR and STLR | CO4 | BT 1 |
| **PART C (12 Marks)** | | | |  |
| **1** | Explain how paging supports virtual memory. With neat diagram explain how logical address is translated into physical address | CO4 | BT 2 |
| **2** | Explain the basic concepts of segmentation in detail. | CO4 | BT 2 |
| **3** | Explain about the following page replacement algorithms a)FIFO b)OPR, c)LRU | CO4 | BT 2 |
| **4** | Describe Structure of Paging Table and its process? | CO4 | BT 2 |
| **5** | What is thrashing and explain the methods to avoid thrashing? | CO4 | BT 2 |
| **6** | Write about the techniques for structuring the page table? | CO4 | BT 3 |
| **7** | Explain about Logical & Physical Addressing? | CO4 | BT 3 |
| **8** | Describe Allocation of Frames mechanisms? | CO4 | BT 3 |
| **9** | Explain working set model in detail and how it is controlled? | CO4 | BT1 |
| **10** | Explain Counting based page replacement and Page Buffering Algorithms | CO4 | BT 2 |

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| **UNIT V** | | | |
| STORAGE MANAGEMENT: Mass storage structure – Overview of Mass storage – Magnetic Disks – Understanding the Basics in storage management – Disk Scheduling – Understanding the various scheduling with respect to the disk – FILE SYSTEM INTERFACE: File concept, File access methods – Understanding the file basics – File sharing and Protection – FILE SYSTEM IMPLEMENTATION: File system structure – Directory Implementation – Understanding the various levels of directory structure- Free space Management – Swap space Management | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | The heads of the magnetic disk are attached to a \_\_\_\_\_ that moves all the heads as a unit. a) spindle **b) disk arm** c) track d) none of the mentioned | CO5 | BT1 |
| **2** | The time taken to move the disk arm to the desired cylinder is called the \_\_\_\_\_\_\_\_\_\_\_\_ a) positioning time b) random access time **c) seek time** d) rotational latency | CO5 | BT1 |
| **3** | SSTF algorithm, like SJF \_\_\_\_\_\_\_\_\_\_ of some requests. **a) may cause starvation** b) will cause starvation c) does not cause starvation d) causes aging | CO5 | BT2 |
| **4** | In the \_\_\_\_\_\_ algorithm, the disk arm starts at one end of the disk and moves toward the other end, servicing requests till the other end of the disk. At the other end, the direction is reversed and servicing continues. a) LOOK **b) SCAN** c) C-SCAN d) C-LOOK | CO5 | BT1 |
| **5** | Virtual memory uses disk space as an extension of \_\_\_\_\_\_\_\_\_ a) secondary storage **b) main memory** c) tertiary storage d) none of the mentioned | CO5 | BT1 |
| **6** | Using swap space significantly \_\_\_\_\_\_\_\_\_ system performance. a) increases **b) decreases** c) maintains d) does not affect | CO5 | BT2 |
| **7** | To create a file \_\_\_\_\_\_\_\_\_\_\_\_ a) allocate the space in file system b) make an entry for new file in directory **c) allocate the space in file system & make an entry for new file in directory** d) none of the mentioned | CO5 | BT1 |
| **8** | Which one of the following explains the sequential file access method? a) random access according to the given byte number **b) read bytes one at a time, in order** c) read/write sequentially by record d) read/write randomly by record | CO5 | BT1 |
| **9** | Management of metadata information is done by \_\_\_\_\_\_\_\_\_\_\_\_ a) file-organisation module **b) logical file system** c) basic file system d) application programs | CO5 | BT1 |
| **10** | The data structure used for file directory is called \_\_\_\_\_\_\_\_\_\_\_\_ a) mount table **b) hash table** c) file table d) process table | CO5 | BT1 |
| **11** | The open file table has a/an \_\_\_\_\_\_\_ associated with each file. a) file content b) file permission **c) open count** d) close count | CO5 | BT1 |
| **12** | The larger the block size, the \_\_\_\_\_\_ the internal fragmentation. **a) greater** b) lesser c) same d) none of the mentioned | CO5 | BT2 |
| **13** | For a direct access file \_\_\_\_\_\_\_\_\_\_\_\_ a) there are restrictions on the order of reading and writing **b) there are no restrictions on the order of reading and writing** c) access is restricted permission wise d) access is not restricted permission wise | CO5 | BT1 |
| **14** | For large files, when the index itself becomes too large to be kept in memory? a) index is called **b) an index is created for the index file** c) secondary index files are created d) all of the mentioned | CO5 | BT2 |
| **15** | The directory can be viewed as a \_\_\_\_\_\_\_\_\_ that translates file names into their directory entries. **a) symbol table** b) partition c) swap space d) cache | CO5 | BT1 |
| **16** | In a tree structure, when deleting a directory that is not empty? a) The contents of the directory are safe **b) The contents of the directory are also deleted** c) contents of the directory are not deleted d) none of the mentioned | CO5 | BT2 |
| **17** | An absolute path name begins at the \_\_\_\_\_\_\_\_\_\_\_\_\_ a) leaf b) stem c) current directory **d) root** | CO5 | BT1 |
| **18** | What is the mount point? **a) an empty directory at which the mounted file system will be attached** b) a location where every time file systems are mounted c) is the time when the mounting is done d) none of the mentioned | CO5 | BT1 |
| **19** | The machine containing the files is the \_\_\_\_\_\_\_ and the machine wanting to access the files is the \_\_\_\_\_\_ a) master, slave b) memory, user **c) server, client** d) none of the mentioned | CO5 | BT1 |
| **20** | In contiguous allocation \_\_\_\_\_\_\_\_\_\_\_\_\_ **a) each file must occupy a set of contiguous blocks on the disk** b) each file is a linked list of disk blocks c) all the pointers to scattered blocks are placed together in one location d) none of the mentioned | CO5 | BT1 |
| **21** | In indexed allocation \_\_\_\_\_\_\_\_\_\_\_\_\_ a) each file must occupy a set of contiguous blocks on the disk **b) each file is a linked list of disk blocks** c) all the pointers to scattered blocks are placed together in one location d) none of the mentioned | CO5 | BT1 |
| **22** | One difficulty of contiguous allocation is \_\_\_\_\_\_\_\_\_\_\_\_\_ **a) finding space for a new file** b) inefficient c) costly d) time taking | CO5 | BT2 |
| **23** | For each file there exists a \_\_\_\_\_\_\_\_\_\_\_ that contains information about the file, including ownership, permissions and location of the file contents. a) metadata **b) file control block** c) process control block d) all of the mentioned | CO5 | BT1 |
| **24** | When in contiguous allocation the space cannot be extended easily? **a) the contents of the file have to be copied to a new space, a larger hole** b) the file gets destroyed c) the file will get formatted and lost all its data d) none of the mentioned | CO5 | BT2 |
| **25** | In the linked allocation, the directory contains a pointer to which block? I. first block II. last block a) I only b) II only **c) Both I and II** d) Neither I nor II | CO5 | BT1 |
| **26** | What is the major disadvantage with a linked allocation? a) internal fragmentation b) external fragmentation c) there is no sequential access **d) there is only sequential access** | CO5 | BT2 |
| **27** | What if a pointer is lost or damaged in a linked allocation? **a) the entire file could get damaged** b) only a part of the file would be affected c) there would not be any problems d) none of the mentioned | CO5 | BT2 |
| **28** | Some directory information is kept in main memory or cache to \_\_\_\_\_\_\_\_\_\_\_ a) fill up the cache b) increase free space in secondary storage c) decrease free space in secondary storage **d) speed up access** | CO5 | BT1 |
| **29** | When a fixed amount of swap space is created during disk partitioning, more swap space can be added only by? I) repartitioning of the disk II) adding another swap space elsewhere a) only I b) only II **c) both I and II** d) neither I nor II | CO5 | BT1 |
| **30** | Indexed allocation \_\_\_\_\_\_\_\_\_ direct access. **a) supports** b) does not support c) is not related to d) none of the mentioned | CO5 | BT1 |
| **PART B (4 Marks)** | | | |
| **1** | Discuss the criteria for choosing a file organization? | CO5 | BT1 |
| **2** | List the common file types along with their extensions and describe each file type? | CO5 | BT1 |
| **3** | Differentiate among the following disk scheduling algorithms?  a) FCFS b) SSTF | CO5 | BT2 |
| **4** | Explain the following in detail with respect to disk? a) Seek time b) Latency c) Access time d) Transfer time | CO5 | BT1 |
| **5** | Give an example of an application in which data in a file should be accessed in the following order: i. sequential ii. Random | CO5 | BT2 |
| **6** | Define the terms – file, file path, directory? | CO5 | BT1 |
| **7** | Explain any four common file attributes? | CO5 | BT1 |
| **8** | Explain any four file operations? | CO5 | BT1 |
| **9** | What are the advantages and disadvantages of contiguous  and non-contiguous memory allocation? | CO5 | BT2 |
| **10** | Discuss in detail about various allocation methods | CO5 | BT1 |
| **11** | Prepare a general graph directory in file system | CO5 | BT1 |
| **12** | Express the views on –disk structure in file system  implementation | CO5 | BT2 |
| **13** | Give the importance of swap space management | CO5 | BT2 |
| **14** | Conclude which disk scheduling algorithm would be the best to Optimize the performance of a RAM disk. | CO5 | BT2 |
| **15** | Summarize the characteristics that determine the disk  access speed. | CO5 | BT2 |
| **16** | Discuss about a Disk space management | CO5 | BT1 |
| **17** | Discuss about Swap -space management | CO5 | BT1 |
| **18** | Define log structured file. What are the disadvantages of log  Structured file systems? | CO5 | BT2 |
| **19** | Discuss the advantage and disadvantages of supporting  links to files that cross mount points | CO5 | BT2 |
| **20** | Discuss the objectives of file management system. | CO5 | BT2 |
| PART C (12 Marks) | | | |
| **1** | Describe indexed file and indexed sequential file organization? | CO5 | BT1 |
| **2** | Describe the file system of UNIX? | CO5 | BT1 |
| **3** | Differentiate among the following disk scheduling algorithms? a) SCAN b) C-SCAN c) LOOK d) C-LOOK | CO5 | BT2 |
| **4** | Explain the following file concepts: a) File attributes b) File operations c) File types d) Internal file structure | CO5 | BT1 |
| **5** | Discuss the following a) File system mounting b) Thrashing | CO5 | BT1 |
| **6** | Explain the concept of file sharing? What are the criteria to be followed in systems which implement file sharing? | CO5 | BT1 |
| **7** | Describe the following Directory Implementation methods?  a) Linear List b) Hash Table | CO5 | BT1 |
| **8** | Explain the concept and techniques of free space management? | CO5 | BT1 |
| **9** | Discuss in detail the performance issues of secondary storage management? | CO5 | BT2 |
| **10** | Consider that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms? A. FCFS B. SSTF C. SCAN D. C-SCAN E. LOOK F. C-LOOK | CO5 | BT5 |

**Note:**

1. **BT Level –** Blooms Taxonomy Level
2. **CO – Course Outcomes**

BTL1 –Remember BTL2 – Understand BTL3 – Apply BTL4 – Analyze BTL5 – Evaluate BTL6 – Create