**Unit-1**

1. Outline the computing environments in detail
2. Explain the following

a)process management b)Memory management C)storage management

1. Define an operating system? State and explain the basic functions or services of an operating system?
2. Explain the differences between multiprogramming and time-sharing systems?
3. Discuss the different structures of OS?
4. Is OS is a resource manager? If so justify your answer
5. Explain the various types of System calls with an example for each.
6. Draw & Explain the dual mode operation of operating system
7. Write a short note on protection&security
8. Discuss the user view and system view of operating system
9. Draw the diagram for storage device hierarchy & explain the storage structure
10. Explain the following

a)process management b)Memory management c)device management

13. Draw and explain the abstract view of the components of a computer system

**Unit-2**

1. Explain critical section problem & what is software based solution to it explain.
2. a)Consider the following set of processes with the length of the CPU burst time given in milliseconds

Process BurstTime

P1 24

P2 3

P3 3

processes are assumed to have arrived in the order p1, p2, p3 all at time 0.

Draw Gantt charts illustrating the execution of these processes using Round Robin (quantum=4) scheduling.

1. explain FCFS scheduling algorithm with suitable example
2. A scheduling mechanism should consider various scheduling criteria to realize the scheduling objectives? List out all the criteria
3. Consider the following set of processes with the length of the CPU burst time given in milliseconds

Process BurstTime Priority

P1 10 3

P2 1 1

P3 2 3

P4 1 4

P5 5 2

The processes are assumed to have arrived in the order p1, p2, p3, p4, p5 all at time 0.

1. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, anon pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum=1) scheduling.
2. What is the turnaround time of each process for each of the scheduling algorithms in part?
3. What is the waiting time of each process for each of the scheduling algorithms in part? Which of the schedules in part a results in the minimal average waiting time?
4. Write short notes on the following.
5. Schedulers
6. Process control block
7. Context switch
8. Consider the following five processes, with the length of the CPU burst time given in milliseconds.

Process Burst time

P1 10

P2 29

P3 3

P4 7

P5 12

Consider the First come First serve (FCFS), Non Preemptive Shortest Job First(SJF), Round Robin(RR) (quantum=10ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time? Discuss.

1. Explain the concept of process with a neat process state diagram
2. Write a short note on monitors
3. Discuss interprocess communication with the help of communication models
4. Elaborate reader-writer problem
5. Explain the following a)Scheduling Queues b)Context switching
6. Explain the following a)process state diagram b)PCB
7. Explain Monitors
8. Explain the following scheduling algorithms with suitable examples a)SJF(shortest job first) b)Priority Scheduling

**Unit-3**

1. Explain the various methods which we apply for recovery from deadlocks
2. write a short note on a)hierarchical paging b)hashed page table c)inverted page table
3. Illustrate the use of Banker’s Algorithm for Deadlock Avoidance
4. Discuss paging and structure of page table in detail
5. List the four data structures that must be maintained to implement banker’s algorithm
6. Distinguish between page table and inverted page table?
7. Explain in detail about resource allocation graph with example
8. Illustrate the necessary conditions for deadlock occurrence
9. Distinguish between internal and external fragmentation?
10. Write a short notes on resource preemption
11. Consider the following snapshot of a system

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PROCESS** | **ALLOCATION** | | | ***MAX*** | | | **AVAILABLE** | | |
|  | **A** | **B** | **C** | ***A*** | ***B*** | ***C*** | **A** | **B** | **C** |
| P1 | 0 | 1 | 0 | *7* | *5* | *3* | 3 | 3 | 2 |
| P2 | 2 | 0 | 0 | *3* | *2* | *2* |  |  |  |
| P3 | 3 | 0 | 2 | *9* | *0* | *2* |  |  |  |
| P4 | 2 | 1 | 1 | *2* | *2* | *2* |  |  |  |
| P5 | 0 | 0 | 2 | *4* | *3* | *3* |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

And answer the following Questions

a) compute the need matrix

b) is the system in a safe state?

c) if a request from process P1 arrives for(1,0,2), can the request be granted immediately?

12. Explain the banker’s algorithms

13. Discuss paging and structure of page table in detail

14. Explain the various methods which we apply for recovery from deadlocks

15. How the memory protection is assured in paging environment?

**Unit-4**

1. Summarize the concept of demand paging
2. Write a short note on performance of demand paging
3. Illustrate the concept of copy on write
4. Explain the concept of virtual memory on windows
5. Summarize&Compare Optimal, LRU and FIFO page replacement algorithms with illustration.
6. Discuss following system calls for file operations:
7. Open()
8. Read()
9. Write()
10. Close()
11. Seek()
12. Consider the following page reference string.

7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0

Assuming three frames, how many page faults would occur in each of the following cases?

1. FIFO
2. Optimal
3. LRU

Note that initially all frames are empty.

1. Discuss the following.
2. File operations
3. File system mounting
4. File sharing
5. Explain thrashing, what are the causes of thrashing & explain the working set model for the same

Consider the following reference string

1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6

Frame size=3 and apply the following page replacement algorithms

a) optimal page replacement

b) LRU

**Unit-5**

1. Explain the access methods of files
2. Briefly outline the directory overview
3. Explain the concept of revocation access rights
4. Explain the concept of goals of protection
5. Explain the following in detail with respect to disk?
6. Seek time
7. Latency
8. Access time
9. Transfer time
10. What is the linked list allocation file implementation technique?
11. State the Access metrics mechanism
12. List the different file system allocation methods?
13. Overview of mass storage structure
14. What is access matrix and how can we implement it?
15. What is protection domain in operating system?
16. Illustrate the concept of file, its attributes and its and its operations
17. Explain the concept of access matrix in detail and explain its implementation strategies
18. Explain free space management in detail
19. Explain the access methods of files
20. Briefly outline the directory overview

**c) Quiz question bank (unit wise)**

**UNIT-1**

1. What is operating system?  
   a) collection of programs that manages hardware resources  
   b) system service provider to the application programs  
   c) link to interface the hardware and application programs  
   d) all of the mentioned
2. Which one of the following is not true?  
   a) kernel is the program that constitutes the central core of the operating system  
   b) kernel is the first part of operating system to load into memory during booting  
   c) kernel is made of various modules which can not be loaded in running operating system  
   d) kernel remains in the memory during the entire computer session
3. Which one of the following error will be handle by the operating system?  
   a) power failure  
   b) lack of paper in printer  
   c) connection failure in the network  
   d) all of the mentioned
4. What is the main function of the command interpreter?  
   a) to get and execute the next user-specified command  
   b) to provide the interface between the API and application program  
   c) to handle the files in operating system  
   d) none of the mentioned
5. By operating system, the resource management can be done via \_\_\_\_\_\_\_\_\_\_  
   a) time division multiplexing  
   b) space division multiplexing  
   c) time and space division multiplexing  
   d) none of the mentioned
6. If a process fails, most operating system write the error information to a \_\_\_\_\_\_
7. In dual mode operations of os 1 represents\_\_\_\_\_\_\_\_\_\_\_\_\_
8. To access the services of operating system, the interface is provided by the \_\_\_\_\_\_\_\_\_\_\_
9. The systems which allow only one process execution at a time, are called \_\_\_\_\_\_\_\_\_\_
10. \_\_\_\_\_\_\_\_\_\_is the extension of Notepad.

**UNIT-2**

* + - 1. In Unix, Which system call creates the new process?  
         a) fork  
         b) create  
         c) new  
         d) none of the mentioned
      2. What is the ready state of a process?  
         a) when process is scheduled to run after some execution  
         b) when process is unable to run until some task has been completed  
         c) when process is using the CPU  
         d) none of the mentioned
      3. What is interprocess communication?  
         a) communication within the process  
         b) communication between two process  
         c) communication between two threads of same process  
         d) none of the mentioned
      4. A set of processes is deadlock if \_\_\_\_\_\_\_\_\_\_  
         a) each process is blocked and will remain so forever  
         b) each process is terminated  
         c) all processes are trying to kill each other  
         d) none of the mentioned
      5. Which of the following is process scheduling algorithms?  
         a) FCFS  
         b) SJN  
         c) RR  
         d) All of the above
      6. A process stack does not contain \_\_\_\_\_\_\_\_\_\_
      7. \_\_\_\_\_\_\_\_system call returns the process identifier of a terminated child.
      8. The address of the next instruction to be executed by the current process is provided by the \_\_\_\_\_\_\_\_\_\_
      9. A process can be terminated due to \_\_\_\_\_\_\_\_\_\_
      10. \_\_\_\_\_is non-preemptive algorithm.

**UNIT-3**

A Process Control Block(PCB) does not contain which of the following?  
a) Code  
b) Stack  
c) Bootstrap program  
d) Data

The state of a process is defined by \_\_\_\_\_\_\_\_\_\_  
a) the final activity of the process  
b) the activity just executed by the process  
c) the activity to next be executed by the process  
d) the current activity of the process

Which of the following is not the state of a process?  
a) New  
b) Old  
c) Waiting  
d) Running

The entry of all the PCBs of the current processes is in \_\_\_\_\_\_\_\_\_\_  
a) Process Register  
b) Program Counter  
c) Process Table  
d) Process Unit

A single thread of control allows the process to perform \_\_\_\_\_\_\_\_\_\_  
a) only one task at a time  
b) multiple tasks at a time  
c) only two tasks at a time  
d) all of the mentioned

PCB Stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_

The number of processes completed per unit time is known as \_\_\_\_\_\_\_\_\_\_

Restricting the child process to a subset of the parent’s resources prevents any process from \_\_\_\_\_\_\_\_\_\_

A parent process calling \_\_\_\_\_ system call will be suspended until children processes terminate.

A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_

**UNIT-4**

* + - 1. Which one of the following is the deadlock avoidance algorithm?  
         a) banker’s algorithmb) round-robin algorithm  
         c) elevator algorithm  
         d) karn’s algorithm
      2. 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
      3. CPU fetches the instruction from memory according to the value of \_\_\_\_\_\_\_\_\_\_

a) program counter

b) status register

c) instruction register

d) program status word

* + - 1. 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

* + - 1. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?

a) fragmentation

b) paging

c) mapping

d) none of the mentioned

* + - 1. Because of virtual memory, the memory can be shared among \_\_\_\_\_\_\_\_\_\_\_\_
      2. \_\_\_\_\_ is the concept in which a process is copied into the main memory from the secondary memory according to the requirement.
      3. Swap space exists in \_\_\_\_\_\_\_\_\_\_\_\_
      4. \_\_\_\_\_\_\_\_\_ replacement allows each process to only select from its own set of allocated frames.
      5. Each entry in a translation lookaside buffer (TLB) consists of \_\_\_\_\_\_\_\_\_\_\_\_

**Unit-5**

* + - 1. Program always deals with \_\_\_\_\_\_\_\_\_\_\_\_

a) logical address b) absolute address

c) physical address d) relative address

* + - 1. 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
      2. Each entry in a segment table has a \_\_\_\_\_\_\_\_\_\_\_\_  
         a) segment base  
         b) segment peak  
         c) segment value  
         d) none of the mentioned
      3. In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_\_\_\_\_\_\_  
         a) oldest page is chosen  
         b) newest page is chosen  
         c) random page is chosen  
         d) none of the mentioned
      4. Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced?  
         a) first in first out algorithm  
         b) additional reference bit algorithm  
         c) least recently used algorithm  
         d) counting based page replacement algorithm
      5. A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_
      6. The address loaded into the memory address register of the memory is referred to as \_\_\_\_\_\_\_\_\_\_\_\_
      7. MMU stands for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      8. The virtual memory manager loads other components of the process only when they are needed. This technique is called \_\_\_\_\_\_\_\_\_\_\_\_\_
      9. Divide logical memory into blocks with the same size as frames are called\_\_\_\_\_\_\_\_\_

OBJECTIVE QUESTIONS

1. What is operating system?

a)collection of programs that manages hardware resources

b) Improve processor execution

c) connection failure in the network

d) Assembly instructions

1. Which of the following is not an advantage of multiprogramming?

(A) Decreased operating system overhead

(B) Ability to assign priorities to jobs

(C) Shorter response time

(D) Increased throughput

1. To access the services of operating system, the interface is Provided by the

a) System calls

b) API

c) Library

d) Assembly instruction

1. The number of processes completed per unit time is known as

a) Output

b) Throughput

c) Efficiency

d) Capacity

1. Which of the following is not the state of a process?

a) New

b) Old

c) Waiting

d) Running

|  |  |
| --- | --- |
| 1. 6. CPU scheduling is the basis of \_\_\_\_\_\_\_\_\_\_\_ a) multiprogramming operating systems b) larger memory sized systems c) multiprocessor systems d) none of the mentioned |  |

1. When a process is in a “Blocked” state waiting for some I/O service. When the service is completed, it goes to the \_\_\_\_\_\_\_\_\_\_

a) Terminated state

b) Suspended state

c) Running state

d) Ready state

1. The portion of the process scheduler in an operating system that dispatches processes is concerned with \_\_\_\_\_\_\_\_\_\_\_\_

a) assigning ready processes to waiting queue

b) assigning running processes to blocked queue

c) assigning ready processes to CPU

d) all of the mentioned

1. In Unix, which system call creates the new process?

a) create

b) fork

c) new

d) none of the mentioned

1. The state of a process is defined by \_\_\_\_\_\_\_\_\_\_

a) the final activity of the process

b) the activity just executed by the process

c) the activity to next be executed by the process

d) the current activity of the process

1. Which of the following computer memory is fastest?

1.Register

2.Hard disk

3.RAM

4.None of the above

1. System call routines of the operating systems are mostly written in

a) C

b) C++

c) JAVA

d) both a and b

1. Characteristics of an operating system is/are

a) Error recovery

b) Resource management

c) Memory management

d) All of the above

1. In Operating Systems, which of the following is/are CPU scheduling algorithms?

a) Priority

b) Round Robin

c) Shortest Job First

d) All of the mentioned

1. Which one of the following is a synchronization tool?

a) thread

b) pipe

c) semaphore

d) socket

1. Which of the following is not an operating system?

a) Windows

b) Linux

c) Oracle

d) DOS

1. Which of the following is objective of an operating system?

a)Hardware

b)Application program

c)Efficiency

d)Error detection.

1. What type of scheduling is round-robin scheduling?

a)Linear data scheduling

b)Non-linear data scheduling

c)Preemptive scheduling

d)Non-preemptive scheduling

1. Which conditions must be satisfied to solve a critical section problem?

a)Bounded waiting

b)Progress

c)Mutual Exclusion

d)All of these

1. What is Inter Process Communication?

a) Communication with in the process

b) Communication between two processes

c) Communication between two threads of same process

d) None of the mentioned

1. CPU fetches the instruction from memory according to the value of \_\_\_\_\_\_\_\_\_\_\_\_

a) program counter

b) status register

c) instruction registers

d) program status word

1. 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

1. \_\_\_\_\_ is the concept in which a process is copied into the main memory from the secondary memory according to the requirement.

a) Paging

b) Demand paging

c) Segmentation

d) Swapping

1. Effective access time is directly proportional to \_\_\_\_\_\_\_\_\_\_\_\_

a) page-fault rate

b) hit ratio

c) memory access time

d) none of the mentioned

1. In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_\_\_\_\_\_\_\_

a) oldest page is chosen

b) newest page is chosen

c) random page is chosen

d) none of the mentioned

1. Operating System maintains the page table for \_\_\_\_\_\_\_\_\_\_\_\_

a) each process

b) each thread

c) each instruction

d) each address

1. Run time mapping from virtual to physical address is done by \_\_\_\_\_\_\_\_\_\_\_\_

a) Memory management unit

b) CPU

c) PCI

d) None of the mentioned

1. A process is thrashing if \_\_\_\_\_\_\_\_\_\_\_\_

a) it is spending more time paging than executing

b) it is spending less time paging than executing

c) page fault occurs

d) swapping can not take place

1. Working set model for page replacement is based on the assumption of \_\_\_\_\_\_\_\_\_\_\_\_

a) modularity

b) locality

c) globalization

d) random access

1. What is Domain?

a) Domain = Set of all objects

b) It is a collection of protection policies

c) Domain= set of access-rights

d) None of the mentioned

1. A Process Control Block(PCB) does not contain which of the following?

a) Code

b) Stack

c) Bootstrap program

d) Data

1. 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

1. \_\_\_\_\_ is the concept in which a process is copied into the main memory from the secondary memory according to the requirement.

a) Paging

b) Demand paging

c) Segmentation

d) Swapping

1. Which of the following mode is used for opening a file in both reading and writing?

a) O\_RDONLY

b) O\_WRONLY

c) O\_RDWR

d) O\_WDR

1. File type can be represented by \_\_\_\_\_\_\_\_\_\_\_\_

a) file name

b) file extension

c) file identifier

d) none of the mentioned

1. Physical memory is broken into fixed-sized blocks called

a)frames

b)pages

c)backingstore

d) none of the mentioned

1. 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

1. 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) None of the mentione

1. With paging there is no \_\_\_\_\_\_\_\_ fragmentation.

a)internal

b)external

c)eithertypeof

d) none of the mentioned

1. Mapping of file is managed by \_\_\_\_\_\_\_\_\_\_\_\_

a)file-metadata

b)pagetable

c)virtualmemory

d)file system

FILL IN THE BLANKS

An operating system act as an\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between hardware and software.

The address of the next instruction to be executed by the current process is provided by the\_\_\_\_\_\_\_\_\_

In Unix, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ system call creates the new process

Semaphores are used to solve the problem of \_\_\_\_\_\_\_\_\_

Dual mode of operating system has \_\_\_\_\_\_\_\_\_ modes.

The \_\_\_\_\_\_\_\_\_\_manages the overall working of a computer.

In UNIX, each process is identified by its \_\_\_\_\_\_\_\_\_\_

A parent process calling \_\_\_\_\_ system call will be suspended until children processes terminate.

\_\_\_\_\_\_\_\_\_\_\_termination refers to termination of all child processes before the parent terminates normally or abnormally.

\_\_\_\_\_\_\_\_\_ contain the entry of all the PCBs of the current processes .

An executed program of computer system is called\_\_\_\_\_\_\_\_ .

The program and languages used by the computer are called \_\_\_\_\_\_\_\_\_\_\_

The operating system is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ software.

Semaphore is an \_\_\_\_\_\_\_\_to solve a critical section problem.

In UNIX, the return value for the fork system call is \_\_\_\_\_ for the child process and \_\_\_\_\_ for the parent process.

In UNIX layered structure, Layer-0 is referred as \_\_\_\_\_\_\_\_\_\_\_\_

Multiprogramming of computer system increases \_\_\_\_\_\_\_\_\_\_

An operating system act as an\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between hardware and software.

The number of processes completed per unit time is known as \_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_ is sometimes called Shortest-Remaining-Time-First scheduling.

Thrashing \_\_\_\_\_\_\_ (increasing/decreasing)the CPU utilization.

a virtual-memory miss is called\_\_\_\_\_\_\_\_

Logical memory is broken into blocks of the same size called \_\_\_\_\_\_\_\_\_

Every address generated by the CPU is divided into two parts. They are \_\_\_\_\_\_\_\_\_\_\_\_

A \_\_\_\_\_\_\_\_\_\_ contains information about the file, including ownership, permissions, and location of the file contents.

A process spends a lot of time paging than executing is called\_\_\_\_\_\_\_\_\_\_\_\_

A set of pages that are actively used together is called \_\_\_\_\_\_\_\_\_\_\_

Physical memory is broken into fixed-sized blocks called \_\_\_\_\_\_\_\_

Every address generated by the CPU is divided into two parts. They are \_\_\_\_\_\_\_\_\_\_\_\_

The data structure used for file directory is called \_\_\_\_\_\_\_\_\_\_\_\_

Logical memory is broken into blocks of the same size called \_\_\_\_\_\_\_\_\_

Virtual Memory can be implemented by \_\_\_\_\_\_\_\_\_\_\_

COW stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_ is a unique tag, usually a number identifies the file within the file system.

Mapping of file is managed by \_\_\_\_\_\_\_\_\_\_\_\_

With paging there is no \_\_\_\_\_\_\_\_ fragmentation.

Mapping of network file system protocol to local file system is done by \_\_\_\_\_\_\_\_\_\_\_\_

When will file system fragmentation occur\_\_\_\_\_\_\_\_\_\_\_\_\_

Contiguous allocation of a file is defined by \_\_\_\_\_\_\_\_\_\_\_\_\_

The first fit and best fit algorithms suffer from \_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| 1 | Which one of the following is the deadlock avoidance algorithm? a) banker’s algorithmb) round-robin algorithm c) resource allocation algorithm d) peterson’s algorithm | [ ] |
| 2 | 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 | [ ] |
| 3 | CPU fetches the instruction from memory according to the value of \_\_\_\_\_\_\_\_\_\_  a) program counter  b) status register  c) instruction register  d) program status word | [ ] |
| 4 | 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 | [ ] |
| 5 | Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?  a) fragmentation  b) paging  c) mapping  d) none of the mentioned | [ ] |
| 6 | Program always deals with \_\_\_\_\_\_\_\_\_\_\_\_  a) logical addressb) absolute address  c) physical addressd) relative address | [ ] |
| 7 | 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 | [ ] |
| 8 | Each entry in a segment table has a \_\_\_\_\_\_\_\_\_\_\_\_ a) segment base b) segment peak c) segment value d) none of the mentioned | [ ] |
| 9 | In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_\_\_\_\_\_\_ a) oldest page is chosen b) newest page is chosen c) random page is chosen d) none of the mentioned | [ ] |
| 10 | Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced? a) first in first out algorithm b) additional reference bit algorithm c) least recently used algorithm d) counting based page replacement algorithm | [ ] |

|  |  |
| --- | --- |
|  |  |
| 1 | High paging activity is called \_\_\_\_\_\_\_\_\_\_\_\_ |
| 2 | Consider the following page reference string. 7,0,1,2,0,3,0,4,2,3,0,3,0,3,2,1,2,0,1,7,0,1 . For LRU page replacement algorithm with 3 frames, the number of page faults is\_ \_\_ |
| 3 | MMU stands for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4 | Deadlocks can be described more precisely in terms of a directed graph called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 5 | Divisions of logical memory into blocks with the same size as frames are called\_\_\_\_\_\_\_\_\_ |
| 6 | Both the best fit and first bit strategies for memory allocation suffer from \_\_\_\_\_\_\_\_\_\_\_\_ |
| 7 | A memory that is larger than the real memory of computer system is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 8 | While executing a program, if the program references a page which is not available in the main memory, then it is known as\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 9 | The algorithm in which we allocate memory to each process according to its size is known as \_\_\_\_\_\_\_\_\_\_\_\_ |
| 10 | When the page fault rate is increasing as the number of allocated frames increases, then that effect is called as \_\_\_\_\_\_\_\_\_\_\_\_\_ |

QUETIONS

Explain the following

a)process management

b)Memory management

C)storage management

Explain the differences between multiprogramming and time-sharing systems?

Define an operating system? State and explain the basic functions or services of an operating system?

Discuss operating system structures?

Draw & Explain the dual mode operation of operating system

Define an operating system? State and explain the basic functions or services of an operating system?

Explain the differences between multiprogramming and time-sharing systems?

Explain the following a) Storage management b) Memory management

Explain the following a)Scheduling Queues b)Context switching

Consider the following set of processes with the length of the CPU burst time given in milliseconds

Process Burst Time

P1 24

P2 3

P3 3

Calculate the average waiting time and average turnaround time by drawing Gantt charts illustrating the execution of these processes using Round Robin (quantum=4) scheduling.

11. What are semaphores? Explain how it can be used to implement mutual exclusion

12. Discuss the different structures of OS?

13. Classify the various types of system calls.

14. Discuss inter process communication with the help of communication models

15. Explain FIFO and Round Robbin CPU scheduling algorithm with example.

16. What is a critical section give solution to the critical section problem using semaphores?

17. What is the information maintained in a PCB?

18. Discuss the user view and system view of operating system

19. Explain the differences between multiprogramming and time-sharing systems?

20. State and explain the various fields of a process control block.

21. Explain the following scheduling algorithms with suitable examples

a) SJF(shortest job first) b)Priority Scheduling

22. Explain the concept of process with a neat process state diagram

1. Write a short note on monitors

A) Define system calls and explain different types of system calls

OR

B) Outline the computing environments in detail.

A) Explain the functions of the following:

i) System programs ii) Command Interpreter

OR

B) Explain the following

a) Scheduling Queues

b) Context switching

A) Calculate the average waiting time and average turnaround time by drawing Gantt chart using FCFS (First Come First Serve) Scheduling algorithm.

Process Burst Time (milliseconds)

P1 5

P2 24

P3 16

P4 10

P5 3

OR

B)Explain the following

a) Process state diagram b)PCB

a) Illustrate the concept of copy on write

OR

b) Explain the concept of virtual memory on windows

a) Explain the banker’s algorithms

OR

b)Discuss paging and structure of page table in detail

a) What is access matrix and how can we implement it?

OR

b)Explain the concept of goals of protection

a)Explain the basic approach of page replacement?

OR

b)What is contiguous memory allocation?

a) Discuss following system calls for file operations:

i) Open()

ii) Read()

iii) Write()

OR

b)Explain thrashing, what are the causes of thrashing & explain the working set model for the same

a) Overview of mass storage structure

OR

b)What is protection domain in operating system?

a) Illustrate the use of Banker’s Algorithm for Deadlock Avoidance

OR

b) Discuss paging and structure of page table in detail

a) Consider the following page reference string.

7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0

Assuming three frames, how many page faults would occur in each of the following cases?

i. FIFO

ii. Optimal

iii. LRU

Note: that initially all frames are empty.

OR

b) Discuss the following.

i. File operations

ii. File system mounting

iii. File sharing

a) Explain the concept of revocation access rights

OR

1. Explain the concept ofaccess matrix in detail and explain its implementation strategies

a) Discuss Paging and structure of page table in detail?

OR

b) Explain the difference between segmentation and paging with neat sketch and examples

a) Explain LRU page replacement algorithm with a neat example.

OR

b) Describe the various system calls for file operations with examples

a) Explain the three allocation methods in file system implementation. Illustrate with proper diagram.

OR

b) What is Access Matrix? How it is implemented?

SHORT QUETIONS

What is kernel and list its functions

List out any four process control system calls?

Write various scheduling criteria for CPU scheduling?

Draw process state diagram

What is a resource-allocation graph?

Define compaction

What are the causes of thrashing

What is file system mounting

Define the terms – object, domain, access right

List the goals of protection?

What are the functions of memory management?

Draw the memory hierarchy available in operating system?

Describe entry and exit sections of a critical section

List the various scheduling criteria for CPU scheduling?

Define segmentation

Describe the techniques for recovery from deadlock?

Define thrashing

What is TLB

List the goals of protection?

Write the main differences between capability lists and access lists?

List out operating system services?

Describe distributed operating system?

What are the different types of scheduling queues?

Define entry section and exit section.

What is the use of Valid-Invalid Bits in Paging?

Define Swapping

What is file sharing?

Explain about thrashing.

Define seek time?

What are goals of system protection?

Define interrupt?

List any four functions of operating system?

Define process state and mention the various states of a process?

Define CPU scheduling?

What are the memory management strategies?

Describe the conditions under which a deadlock situation may arise?

Define page fault

List the file attributes

What is indexed allocation

What is free space list

LONG QUETIONS

Describe different computing environments

OR

Define an operating system? State and explain the basic functions and services of an operating system?

Consider the following set of processes with the length of the CPU burst time given in milliseconds

Process BurstTime Priority

P1 10 3

P2 1 1

P3 2 3

P4 1 4

P5 5 2

The processes are assumed to have arrived in the order p1, p2, p3, p4, p5 all at time 0.

a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, anon pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum=1) scheduling.

b) What is the turnaround time of each process for each of the scheduling algorithms in part?

c) What is the waiting time of each process for each of the scheduling algorithms in part? Which of the schedules in part a results in the minimal average waiting time?

Discuss interprocess communication with the help of communication models

Consider the following snapshot of a system

PROCESS ALLOCATION MAX AVAILABLE

A B C A B C A B C

P1 0 1 0 7 5 3 3 3 2

P2 2 0 0 3 2 2

P3 3 0 2 9 0 2

P4 2 1 1 2 2 2

P5 0 0 2 4 3 3

And answer the following Questions

a) compute the need matrix

b) is the system in a safe state?

c) if a request from process P1 arrives for(1,0,2), can the request be granted immediately?

OR

Discuss paging and structure of page table in detail

Consider the following page reference string.

7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0

Assuming three frames, how many page faults would occur in each of the following cases?

i. FIFO

ii. Optimal

iii. LRU

OR

Discuss the following.

i. File operations

ii. File system mounting

File sharing

What is access matrix and how can we implement it?

OR

(a) What is the linked list allocation file implementation technique?

(b) Explain the following in detail with respect to disk?

a) Seek time

b) Latency

c) Access time

d) Transfer time

Explain the following

a)process management

b)Memory management

c)device management

OR

a) Draw and explain the abstract view of the components of a computer system

b) Discuss the user view and system view of operating system

Write short notes on the following.

a) Schedulers

b) Process control block

c) Context switch

OR

Explain the following

a)Scheduling Queues

b)Context switching

write a short note on

a) hierarchical paging

b)hashed page table

c) inverted page table

OR

a) Illustrate the use of Banker’s Algorithm for Deadlock Avoidance

b) Discuss paging and structure of page table in detail

Discuss following system calls for file operations:

i) Open()

ii) Read()

iii) Write()

iv) Close()

v) Seek()

OR

Consider the following page reference string.

7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0

Assuming three frames, how many page faults would occur in each of the following cases?

i. FIFO

ii. Optimaliii. LRU

a) Write a short note on protection&security

b) What is the linked list allocation file implementation technique?

OR

a) Explain the access methods of files

b) Briefly outline the directory overview

(a) Explain about multiprogramming and time sharing operating system?

(b) What are the various objectives and functions of Operating systems?

OR

(a) What is system calls in OS? Explain in detail with its types

(b) Describe about user interface?

(a) Explain Round Robin scheduling algorithm with example.

(b) Explain about different multithreading models

OR

What is the important feature of critical section? State the Readers Writers problem and give solution using semaphore.

(a) Explain about contiguous memory allocation?

(b) Illustrate the use of Banker’s Algorithm for Deadlock Avoidance.

OR

Briefly explain and compare, fixed and dynamic memory partitioning schemes.

(a) Explain about the following page replacement algorithms with an example a)FIFO b)Optimal, c)LRU

(b) What is virtual memory? Mention its advantages.

OR

(a) Explain different system calls for file operations.

(b) Briefly explain about file access methods.

(a) Briefly outline the directory implementation overview.

(b) Overview of mass storage structure.

OR

(a) Explain the concept of access matrix in detail and explain its implementation strategies.

(b) Explain the concept of revocation access rights.

Explain the various types of System calls with an example for each

OR

a)Explain the differences between multiprogramming and time-sharing systems?

b)Discuss the different structures of OS?

Explain critical section problem & what is software based solution to it explain.

OR

Explain the following scheduling algorithms with suitable examples a)SJF(shortest job first) b)Priority Scheduling

a)Distinguish between internal and external fragmentation?

b)Discuss paging and structure of page table in detail ?

OR

Explain the various methods which we apply for recovery from deadlocks

a)Write a short note on performance of demand paging

b)Consider the page reference string.

7,0,1,2,0,3,0,4,2,3,0,3,2,3 with 4 page frames. find the number of page faults using FIFO page replacement algorithm.

OR

Discuss the following.

i. File operations

ii. File system mounting

iii. File sharing

a)List the different file system allocation methods?

b)Explain the concept of goals of protection?

OR

a)What is the linked list allocation file implementation technique?

b)State the Access metrics mechanism?