

## **CS6401 – OPERATING SYSTEM**

### **POSSIBLE 16 MARK QUESTIONS**

#### **UNIT -I**

- 1) Discuss about various system components in detail. (or) Explain about various managements of operating system and responsibilities
- 2) Discuss the following a) Operating System service b) Cache Memory c) Direct Memory
- 3) Give the details about hardware protection and dual mode protection.
- 4) Explain about Multiprocessor systems and distributed systems.
- 5) (i) List and explain the classification of system calls and its significance  
(ii) Explain about system call implementation with parameter passing methods.
- 6) (i) How could a system be designed to allow a choice of operating system from which to boot? What would the boot strap program need to do?  
(ii) How do clustered systems differ from multi-processor systems? What is required for two machines belonging to cluster to cooperate to provide a highly available service?
- 7) Explain in detail about computer system organization.
- 8) Briefly explain the operating system structure and various operations of operating system.
- 9) Describe in detail about Evolution of Operating Systems
- 10) Describe about interrupt processing in detail.
- 11) Discuss briefly about Direct Memory Access.
- 12) Write short notes on SysGen and System Boot. (6)

#### **UNIT-II**

1. (i) Draw the state diagram of a process from its creation to termination, including ALL transistions, and briefly elaborate every state and every transitions. (Nov/Dec 2014)  
(ii) What are threads? Why are they required? Discuss and differentiate between kernel level and user level tread. (Nov/Dec 2014)
2. (i) What are interacting processes? Explain any two methods of implementing interacting processes. (Nov/Dec 2014)  
(ii) Explain in detail about the different multi threading models with neat diagram. (Nov/Dec 2014)

3. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process Burst Time Priority

<i>P1</i>	10	3
<i>P2</i>	1	1
<i>P3</i>	2	3
<i>P4</i>	1	4
<i>P5</i>	5	2

The processes are assumed to have arrived in the order *P1*, *P2*, *P3*, *P4*, *P5*, all at time 0.

- Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.
  - What is the turnaround time of each process for each of the scheduling algorithms in part a?
  - What is the waiting time of each process for each of the scheduling algorithms in part a?
  - Which of the schedules in part a results in the minimal average waiting time (over all processes)?
4. Explain in detail about any three policies for process scheduling that uses resource consumption information. What is response ratio with suitable examples. ( Nov/Dec 2014)
5. What is a Deadlock? How does a deadlock occur? How can a system recover from deadlock?
6. Explain Banker's Algorithm in detail.
7. What is the need for process synchronization? Explain critical section problem with a two process.
8. Explain the classical critical section problems.
9. i) Demonstrate that monitors and semaphores are equivalent in so far as they can be used to implement the same types of synchronization problems.
- ii) Describe how you could obtain a statistical profile of the amount of time spent by a program executing different parts of its code. Discuss the importance of obtaining this information.
10. i) Explain operation on processes in detail
- ii) Describe the actions taken by a kernel to context-switch between processes.
11. i) What are semaphores? How do they implement mutual exclusion? ( Nov/Dec 2014)
- ii) Give a solution for readers writers problem using conditional critical region ( Nov/Dec 2014)

### **UNIT-III**

1. Explain about contiguous memory allocation.
2. Give the basic concepts about paging.
3. Explain the basic concepts of segmentation.
4. Explain the various page replacement strategies.(Nov/Dec 2014)
5. What happens on a page fault?
6. Explain in detail about swapping and thrashing.
7. Write in detail about Virtual memory.
8. (i) A system provides support for user-level and kernel-level threads. The mapping in this system is one to one (there is a corresponding kernel thread for each user thread). Does a multithreaded process consist of (a) a working set for the entire process or (b) a working set for each thread? Explain.  
(ii) The slab – allocation algorithm uses a separate cache for each different object type. Assuming there is one cache per object type, explain why this scheme doesn't scale well with multiple CPUs. What could be done to address this scalability issue?
9. Consider the following segment paging memory system. There are 4 segments for the given process and a total of 5 page tables in the entire system. Each page table has a total of 8 entries. The physical memory requires 12 bits to address it; there are a total of 128 frames.
10. (i) How many bytes are contained within the physical memory?  
(ii) How large is the virtual address?  
(iii) What is the physical address that correspond to virtual address 0x312?  
(iv) What is the physical address that correspond to virtual address 0x1E9?(NOV/DEC 2014)
- 10.Explain in detail about Demand Paging.
- 11.Explain in detail about Paging Hardware.
- 12.Explain briefly about structuring the page table.
- 13.Discuss about Allocation of frames.
- 14.Explain about the methods to Allocate Kernel Memory.

### **UNIT-IV**

1. Explain the various disk scheduling algorithms with examples. (APRIL 2011)

2. i) What is disk management? Explain in detail how to improve the disk performance. (8) (NOV/DEC 2014)
3. ii) Describe three circumstances under which blocking I/O should be used. Describe three under which nonblocking I/O should be used. Why not just implement nonblocking I/O and have processes busy-wait until their device is ready?(8) (NOV/DEC 2014)
4. Suppose that a disk drive has 5,000 cylinders, numbered from 0 to 4999. The drive is currently serving a 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 the pending requests for each of the following disk-scheduling algorithms?  
i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN vi) C-LOOK (Nov/Dec 2012)
5. i) What are files and explain the access methods for files?(APRIL 2011)  
ii) Explain about file system mounting with example.
6. i) Explain about file protection and sharing. (APRIL 2011)  
ii) Explain about directory implementation.
7. i) Discuss the different techniques with which a file can be shared among different users. (8) (NOV/DEC 2014)  
ii) What is File protection and security? Compare both and also explain the techniques to protect user files. (8) (NOV/DEC 2014)
8. Explain the different file allocation methods for disk space. Mention their advantages and disadvantages. (Nov/Dec 2012)
9. i) Write in detail about File-System Implementation (6) (NOV/DEC 2014)  
ii) A file system on a disk has both logical and physical block sizes of 512 bytes. Assume that the information about each file is already in memory using contiguous, linked and indexed allocation strategies answer the following questions. (10) (NOV/DEC 2014)
  - 1) How is the logical-to-physical address mapping accomplished in this system? (for the indexed allocation, assume that a file is always less than 512 block long)
  - 2) If we are currently at logical block 10 (the last block accessed was block and want to access logical block 4, how many physical blocks must be read from the disk?
- 11.i) Explain the issues in designing a file system.  
ii) Explain the various directory structures. (Nov/Dec 2012)

- 12.What are the various methods for free space management?
- 13.Write in detail about layered file system.
- 14.Explain about file system in Linux
- 15.Explain about file system Windows XP.(Nov/Dec 2012)
- 16.Explain the tertiary storage structure.
- 17.Write short notes on I/O on Linux.
- 18.Explain about interrupts and interrupt-driven I/O cycle  
Explain about DMA.
- 19.Write about the application I/O subsystem.
- 20.Write about the kernel I/O subsystem and its services (APRIL 2011, Nov/Dec 2012)
- 21.Explain how to transform I/O to hardware operations with necessary diagram.
- 22.Write short notes on Streams.
- 23.Discuss the performance of I/O system.
- 24.Compare synchronous and asynchronous input / output with the help of an example.  
(8) (NOV/DEC 2014)

#### UNIT-V

1. How to manage domain names for your server and for any virtual domains residing on your system.
2. Explain the jobs responsibilities of Linux system administrator:
3. How to install debian? List and explain the steps.
4. Explain in detail about setting and configuring the DNS server.
5. Describe the distributed method of resolving domain names.
6. What is DHCP and explain about the installation and services provided by DHCP.
7. Explain in detail installing and configuring XEN.
8. Explain in detail installing and configuring VM ware.
9. What is meant by virtualization? Explain in detail about its basic concepts. (or) What are the steps to do virtualization and explain step by step.