Operating System Study and Unix System Programming

2008 November

Science Computer Science

TYBSc

University of Mumbai

T.Y. B.Sc. Computer Sci. P-III
Operating System System Study and
UNIX System Programming

VT March 08,236
Con. 1374–08. PC–5050

(3 Hours) [Total Marks : 100

N.B. : 1. **All questions are compulsory. Figures to the right indicate marks.**
2. **Answers to two sections must be written & submitted separately & mixing of subsections is not allowed.**
3. **Symbols have their usual meaning unless otherwise stated.**
4. **Illustrations, in-depth answers & diagrams will be appreciated.**

Section I

Q1 a) What are Distributed Systems?Explain the need for developing Distributed Systems. (6)
b) What are System Calls? Explain the various types of System Calls (6)
c) Explain the Layered approach to the operating System Design Architecture . (5)

OR

Q.1 p) Explain either direct or indirect method of communication between two process (6)
q) Explain the functions of short term ,medium term and long term schedulers (6)
r) Explain with a neat diagram the CPU- I/O burst cycle (5)

Q.2 a) Explain the term Semaphore and its Usage. (6)
b) Explain the terms Mutual Exclusion and Critical Section (6)
c) .Process : P1 P2 P3 P4 P5 (5)
Burst Time : 40 20 10 20 50
i. Draw a Gantt chart to trace the process execution
ii. Applying FCFS and SJF principle, find the turnaround time of each process
4. Calculate the average waiting time of the process

OR

Q.2 p) Define a Monitor. Describe its structure with a neat diagram. (6)
q) Explain the various criteria based on which process scheduling algorithm is selected (6)
r) Explain Resource Preemption technique used in deadlock Elimination (5)

Q.3 a) Explain the three placement algorithm used in Dynamic Partitioning technique (6)
b) Explain any <u>one</u> of the following in detail (5)
i) Simple Paging Technique ii) Indexed File allocation Technique
c) Define a File, Field and Record. Explain the various file attributes (5)

OR

Q.3 p) Explain any <u>one</u> method of performing I/O (6)
i) Interrupt Driven I/O
ii) Direct Memory Access
q) Explain the need for swapping. How is the swapping technique performed? (5)
r) For the following page reference string 0 1 2 3 1 0 1 4 0 1 2 3 4 with main memory frames as 3 find the number of page faults. Increasing the main memory frames to 4 check whether it follows Belady's Anamoly? (5)

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Section II

Q4	a)	Explain in detail the ls command in linux along with any four options.	(6)
	b)	Explain cp, mv and rm commands of Unix with syntax and example.	(6)
	c)	Write a short note on piping.	(5)

OR

Q.4	p)	Explain the use of cat command and its different options.	(6)
	q)	Describe the process of creating and saving a file using vi editor .	(6)
	r)	Differentiate foreground and background process. How can the system administrator prematurely terminate a running process?	(5)
Q.5	a)	State and explain any five shell environment variables.	(6)
	b)	Explain the use of switch statement in shell script with an example.	(6)
	c)	Explain the purpose of the following commands - i) chown ii)chgrp iii)chown	(5)

OR

Q.5	p)	What are links? Differentiate between hard links and symbolic links.	(6)
	q)	Write a shell script to input numbers at command line and print a count of positive and negative numbers entered.	(6)
	r)	Write a short note on /etc/passwd file.	(5)
Q.6	a)	Explain the process of creating a file system and mounting it.	(6)
	b)	How tar utility can be used for creating backup?	(5)
	c)	Explain any one of the following i) Telnet ii)ftp	(5)

OR

Q.6	p)	Explain the following commands with syntax and example - i) du ii) df	(6)
	q)	Explain any four commands that can be executed only by the super-user	(5)
	r)	Write a short note on network addressing system.	(5)