

III B.Tech I Semester Examinations, May/June 2012

LINUX PROGRAMMING

Information Technology

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions

All Questions carry equal marks

1. (a) Differentiate between multithreaded programming and single threaded programming.
(b) Illustrate `pthread _ create()` and `pthread _ kill()` function prototypes with an example. [6+9]
2. (a) Explain the differences between a line editor and a stream editor.
(b) Write a short note on the following commands:
 - i. `ls`
 - ii. `ln`
 - iii. `mv`
 - iv. `cp`.[3+12]
3. Explain the following with example:
 - (a) Process Creation
 - (b) Process Termination
 - (c) Signal function
 - (d) Reliable signals. [15]
4. (a) Explain how TCP connections are established and terminated.
(b) Write notes on byte ordering functions. [7+8]
5. (a) Explain how the shell treat a command line passed to it.
(b) Write a shell script to find and delete all file with the word "unix". [7+8]
6. (a) Write a program to simulate sleep and wakeup behaviors among two processes using any IPC mechanisms.
(b) Illustrate `mkfifo()` system call with an example. [7+8]
7. What is file mode creation mask? Explain how to set it for a process. What happens if the file mode creation mask is set to 777(Octal) value? [15]
8. Semaphores are created with `semget` but initialized with `semctl`. Hence creation and initialization cannot be accomplished in a single atomic operation. Describe a situation where this may lead to a race condition and suggest a solution to this problem. [15]

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1. Explain the following commands with examples:
 - (a) Creating a Directory
 - (b) Copying a file from one directory to another
 - (c) Moving the files between Directories
 - (d) Deleting a Directory and a File. [15]
2. Explain the following concepts about pipes:
 - (a) Pipes between two process
 - (b) Pipes among three process in a shell. [7+8]
3. (a) What is an orphan process? Write a program to illustrate orphan process.
(b) Explain various exit statuses with an example program. [7+8]
4. (a) Explain how to control a shared-memory segment.
(b) Explain how to attach and detach a shared-memory segment. [7+8]
5. (a) Differentiate between advisory locking and mandatory locking.
(b) Explain the following system calls related to linking link(), unlink() and symlink(). [7+8]
6. List and explain various POSIX APIs for mutex locks manipulation. [15]
7. (a) What is command substitution? What is the token used with command substitution?
(b) Write a shell script that allows a user to view, add, delete or modify a setting in a configuration file. [7+8]
8. (a) How TCP_NODELAY option is used while sending small packets?
(b) Explain how a client running on IPV4 configured host communication with a server in IPV6 host? [6+9]

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1. What are pipes ? Explain their limitations. Explain how pipes are created and used in IPC with an examples. [15]
2. Explain various APIs available in POSIX.1b for increasing and decreasing a semaphore value with an example. [15]
3. (a) Differentiate between a process, a program and a job.
(b) Explain various job control commands and their options with examples.
(c) What is the command used to bring a background job into the foreground job? [5+5+5]
4. Briefly explain the purpose of the following utilities:
(a) grep
(b) comm.
(c) tee
(d) awk. [15]
5. Describe the functionality provided by system V IPC semaphore mechanism. Explain how it is implemented. [15]
6. (a) Define a system call? Explain how the system call differs from that of the library functions.
(b) What is the purpose of dot and dot dot directories in the file system?
(c) What are the drawbacks of using a symbolic link instead of a hard link. [5+5+5]
7. Suppose a process does not wish to block until its children terminate. Explain how it can ensure that child processes are cleaned up when they terminate with a sample program. [15]
8. Write and explain Concurrent server program which uses TCP and show the status of Client and Server before call to fork, after fork and after socket closing by parent and child. [15]

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1. Write a short note on the following:
 - (a) Light Weight Processes
 - (b) Semaphores
 - (c) Mutexes
 - (d) Threads. [15]
2. Write short notes on the following utilities:
 - (a) ps
 - (b) telnet
 - (c) finger
 - (d) ulimit. [15]
3. How is the shared memory model implemented to achieve IPC? Explain briefly. [15]
4.
 - (a) Explain how debugging can be done in a shell script.
 - (b) Write a shell script to print the details of the user login information. [7+8]
5.
 - (a) Write a program to illustrate `msgsnd()` and `msgrcv()` system calls.
 - (b) What is meant by name space? Give the name spaces of various IPC mechanisms in Unix. [7+8]
6.
 - (a) Define the three states of TCP connection establishment and termination.
 - (b) Write a program to illustrate `bind()`, `listen()` and `accept()` system calls. [6+9]
7. Explain how the `fcntl()` system call is used for changing the properties of a file. What are the status flags that are associated with `fcntl()`? Illustrate `fcntl()` with a program. [15]
8.
 - (a) What are the signals that are not ignored or blocked? Explain the reason behind it with an example.
 - (b) Illustrate SIGILL and SIGINT with an example program. [7+8]
