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CS61

Sixth Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Unix System Programming

Time: 3 hrs. Max. Marks:100

Note : ***Answer any FIVE full questions.***

1 a. What are the major differences between ANSI C and K and R 'C'? Explain with examples. **(08 Marks)**

b. List at least four compile time limits along with their minimum values and explain their meaning. Write a 'C' program that displays the values of the above configuration limits using sysconf and pathconf functions. **(08 Marks)**

c. Describe the characteristics of POSIX.1 FIPS standard. **(04 Marks)**

2 a. Explain five different file types that are supported on UNIX along with the procedure to create the file of each type. **(08 Marks)**

b. Explain the UNIX kernel support files with a neat diagram. **(08 Marks)**

c. Write a program in C/C++ to emulate the UNIX ln command. **(04 Marks)**

3 a. What is file and record locking? Explain with fcntl system call. Write a program in C/C++ to set an exclusive lock on the entire file using fcntl system call. If fcntl fails, find out who has locked the file and display all the lock information to the standard output. **(10 Marks)**

b. Explain the following API's along with their prototype definitions :
i) open ii) lseek iii) fstat **(06 Marks)**

c. Write a program in C/C++ to implement UNIX chown program **(04 Marks)**

4 a. Describe how a 'C' program is started and how it is terminated with a neat block diagram and also demonstrate the use of atexit function by writing the program of exithandlers. **(08 Marks)**

b. With a neat block diagram explain the UNIX kernel support for processes. **(08 Marks)**

c. Explain the memory layout of a 'C' program with a neat diagram. **(04 Marks)**

5 a. What is fork and vfork? Explain with an example program for each. **(06 Marks)**

b. How many processes are created by executing the following program excluding the parent process?

```
int main(void)
{
    for (int i = 0 ; i < 3 ; ++i)
    fork( ) ;
    return 0;
}
```

(02 Marks)

c. What is a zombie process? What is the overhead associated with zombies? **(04 Marks)**

d. Explain 6 different exec functions. Describe how their functionality differ from each other. Write a program in C/C++ that executes an interpreter file. **(08 Marks)**

6 a. What is meant by job control? What support is required for job control, explain with an example. **(10 Marks)**

b. What is a signal? Explain the different dispositions of a signal when it occurs. When do you say a signal is pending? Write a program in C/C++ that masks SIG-PIPE and SIG-ABORT signals, check if they are pending. If they are pending, unmask and service them. **(10 Marks)**

7 a. What is a daemon process? Discuss the basic coding rules, along with the code to create a daemon process. **(10 Marks)**

b. What is FIFO? Explain how it is used in IPC (interprocess communication). Discuss with an example the client/server communication using FIFO's. **(10 Marks)**

8 a. Explain identifier, key and permission structure of IPC. **(10 Marks)**

b. Explain popen and pclose functions with their prototypes and a program in C/C++ to demonstrate the popen and pclose functions. **(10 Marks)**

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