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10CS62

**Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**UNIX System Programming**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting atleast TWO questions from each part.**

**PART – A**

- 1 a. What is the need of ANSI standard for C language? Explain const and volatile data type qualifiers with example. (05 Marks)  
b. Describe ANSI C defined set of CPP symbols. (05 Marks)  
c. Write a C/C++ POSIX compliant program to check the following limits :  
i) Max. number of child processes  
ii) Max. number of opened files  
iii) Number of clock ticks/second  
iv) POSIX version value  
v) Max. path name in bytes  
and prints a relevant error messages when there is a failure of APIs. (10 Marks)
- 2 a. Define major device number and minor device number. Write the UNIX command with parameters to create the following :  
i) Block device file/devt/bdsk with major and minor numbers of 287 and 101, respectively  
ii) Symbolic link/usr/many/slink which references the file/usr/jose original. (04 Marks)  
b. List any eight UNIX/POSIX file attributes and their meaning. Which of these attributes remains constant? List any two system calls and their respective commands that changes the attribute values and also mention which attributes get changed by these system calls. (10 Marks)  
c. Explain file table and its entries during file manipulation. When rc = 2 in file table what is the meaning? (06 Marks)
- 3 a. Write a C/C++ program to do the following operations using relevant headers and APIs.  
i) To check named file exists or not  
ii) If named file does not exist, create a file and copy the "hello, world", to a file  
iii) If named file does exist, program will simply read data from the file displays the contents of file on standard o/p device  
iv) For same file print inode number and file size in bytes using stat system call.  
Use any regular file. (10 Marks)  
b. Explain fcntl API when used for file locking. (10 Marks)
- 4 a. Explain a memory layout of a C program. (08 Marks)  
b. Explain with programming examples, setjmp and longjmp functions. (06 Marks)  
c. Explain kernel support for a process show relevant data structures. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

## PART - B

- 5 a. What are swapper, init, and page daemon processes? List any four different process IDs. (04 Marks)
- b. With separate programming examples, explain fork and vfork functions. (10 Marks)
- c. Explain the sequence of processes involved in executing the TELNET server. (06 Marks)
- 6 a. Explain basic rules to coding a daemon, to prevent unwanted interactions from happening. (12 Marks)
- b. Explain kill() API with programming example. Also explain kill command with an example. (08 Marks)
- 7 a. Define FIFO. What is the difference between FIFO and pipe? What are the two uses of FIFO? Explain each one with examples. (12 Marks)
- b. Explain the following statement :  
msqid = msgget(15, IPC-CREAT/0644);  
Also explain following functions.  
i) msgctl ii) msgrcv. (08 Marks)
- 8 a. Write a C/C++ program to create and shared memory segment of 100,000 bytes, print first and last address of memory in which segment is attached and finally remove the shared memory segment from memory. Use relevant shared memory functions and headers. (08 Marks)
- b. Explain passing file descriptors over UNIX domain sockets with relevant structures and macros. (12 Marks)

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