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10CS62

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Unix System Programming

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. List and explain the features by which ANSI C differs from K and R C with an example for each. **(08 Marks)**

b. Explain POSIX standard with different subsets of POSIX. Write C/C++ program to display POSIX-VERSION. **(07 Marks)**

c. Explain the common characteristics of API along with error status codes with their meaning. **(05 Marks)**

2 a. Explain different file types available in UNIX/POSIX with different commands that operate on the files. **(08 Marks)**

b. List and explain all the attributes of UNIX or POSIX file with their meaning. Which attributes remain unchanged for the entire life of the file and why? **(07 Marks)**

c. Draw and explain with neat data structures of UNIX Kernel showing the file manipulation when a file data.txt is hard linked by another file data1.txt and also what happens when the file descriptor of data.txt is duplicated another file descriptor fd1. **(05 Marks)**

3 a. Write the prototype of umask and show and explain the final permissions being applied on opening a file /usr/work/fil1.txt with permissions 0557. Assume a umask value of 031 of the calling process in UNIX system. Show and explain the final permissions applied on that file. **(05 Marks)**

b. Explain the prototypes of the following API's
   i) open
   ii) lseek
   iii) fstat
   iv) chmod **(08 Marks)**

c. What is the advantage of locking files? Explain mandatory and advisory locks? Why advisory lock in considered safe? What are the drawbacks of advisory lock? Explain. **(07 Marks)**

4 a. Explain with a neat diagram how a C-program is started and terminated in various ways? **(08 Marks)**

b. Explain the memory layout of a C-program with a neat diagram. **(07 Marks)**

c. What are environmental variables and command line arguments? Write a C program to echo all its command line arguments to its standard output. **(05 Marks)**

PART – B

5 a. Explain the fork and vfork system call. How fork system call differs from vfork? Write a program to demonstrate fork and vfork system calls. **(10 Marks)**

b. Explain the BSD terminal login with suitable diagrams and the steps involved in configuring it. **(10 Marks)**

6 a. Explain the following API's along with their prototypes with respect to signals.
   i) sigprocmask
   ii) sigaction
   iii) alarm
   iv) kill **(10 Marks)**

   b. What are Daemon processes? Explain with a neat diagram the error logging facility for a daemon process. **(10 Marks)**

7 a. What are three different ways in which client and server process can get access to same IPC structure? Explain different prototype of API's that support these structures. **(10 Marks)**

   b. Explain client/server communication using FIFO with a neat diagram. **(10 Marks)**

8 a. What are semaphores? Explain the API's along with the relevant data structure involved in implementation of semaphores. **(10 Marks)**

   b. Write short notes on any two of the following :
   i) Socket
   ii) Shared Memory
   iii) Stream pipes. **(10 Marks)**

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