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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