CBCS SCHEME

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15CS744

Seventh Semester B.E. Degree Examination, June/July 2023
UNIX System Programming

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What is the need for standardization of UNIX and C-program language? Brief out the difference between ANSI-C and UNIX with examples. **(05 Marks)**

b. Write short notes on POSIX.1 FIPS standard. **(05 Marks)**

c. Write a C/C++ program that displays the value of configuration limits using sysconf and pathconf functions. **(06 Marks)**

OR

2 a. Explain POSIX feature test Macros with their meanings and example with program. **(06 Marks)**

b. Define API and its characteristics. Explain why calling API is more time consuming than calling a user-function. **(06 Marks)**

c. Write a C/C++ program structure to filter out the non-POSIX complaint codes from user-program. **(04 Marks)**

Module-2

3 a. Describe UNIX Kernel support for files. **(06 Marks)**

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

c. Explain how fcntl API is used for file and record locking. **(06 Marks)**

OR

4 a. Explain the different Data Structure supported by UNIX kernel for file manipulation with neat diagram. **(05 Marks)**

b. Explain the following API with their prototype definition: (Any three)
(i) Lseek (ii) fstat (iii) link (iv) umask **(06 Marks)**

c. Write a C/C++ program to implement unix chown. **(05 Marks)**

Module-3

5 a. Explain memory layout of C-program. **(05 Marks)**

b. Explain the use of process accounting structure with an example in an UNIX. **(05 Marks)**

c. Define environmental variable. Write a C/C++ program that outputs the contents of its environment list. **(06 Marks)**

OR

6 a. Explain the following system call with prototype (Any three) :
(i) Vfort (ii) Wait (iii) Waitpid (iv) Exit **(06 Marks)**

b. Write a C/C++ program to demonstrate the exec function. **(05 Marks)**

c. What is Zombie process? Write a C/C++ program to avoid Zombie process by forking twice. **(05 Marks)**

Module-4

7 a. Define SIGNAL and explain how to setup a signal handler. **(06 Marks)**

b. Explain the following API with prototypes:
(i) Kill (ii) Sigsetjmp (iii) Siglongjmp **(06 Marks)**

c. Write a C/C++ program to implement the use of Sigprocmask or Sigpending functions. **(04 Marks)**

OR

8 a. Explain UNIX kernel support for handling signals. **(04 Marks)**

b. What is Daemon process and explain the basic coding rules. **(07 Marks)**

c. Write a C/C++ program to setup signals SIGALRM. **(05 Marks)**

Module-5

9 a. Describe IPC methods. **(04 Marks)**

b. Define pipes and explain how pipes are created and used in IPC. Write a C/C++ program to send the message "EDGE_INFO" from parent to child process through pipe. **(06 Marks)**

c. Explain the message Queue with prototypes. **(06 Marks)**

OR

10 a. Define shared memory concept and explain how it is used for implementing IPC. **(04 Marks)**

b. What is semaphores and explain the different system calls available to create and manipulate semaphores. **(06 Marks)**

c. Explain the client-server communication with a diagram using FIFO. **(06 Marks)**

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