CBCS SCHEME

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17CS744

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
UNIX System Programming

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Discuss the major differences between ANSI 'C' and K and R 'C' with an example each.
   (08 Marks)
   b. Write a C/C++ POSIX compliant program that prints the POSIX defined configuration options supported on any given system using feature test macros. **(05 Marks)**
   c. Explain setlocale( ) function with an example program. **(07 Marks)**

OR

2 a. Write a C/C++ POSIX compliant program to check the following limits:
      (i) Number of clock ticks
      (ii) Maximum number of child process
      (iii) Maximum path length
      (iv) Maximum number of characters in a file name
      (v) Maximum number of open files
      (vi) Maximum number of semaphores per process
      (vii) Number of simultaneous asynchronous I/O **(07 Marks)**
   b. Distinguish between ANSI C and C++. **(03 Marks)**
   c. Explain the common characteristics of API and list any six commonly occur error status codes along with their meaning. **(10 Marks)**

Module-2

3 a. Discuss the major difference between hard link and symbolic link with an example.
   (06 Marks)
   b. Find the actual file permission if open is called to create a file /usr/vtu.txt. Assume default file permissions is 0777 and umask for the calling process is
   umask(| S_IWOTH | S_IXOTH | S_IWGRP) **(04 Marks)**
   c. Using suitable diagram show the processes File Descriptor Table (FDT), File Table (FT) and Inode Table (IT) contains after the execution: "A process has opening 4 files – "xyz" for read only and "xyz" again write only, "abc" for read write and again "abc" for write only. Discuss the same in detail. **(10 Marks)**

OR

4 a. Discuss the fcntl( ) system call in detail with example. **(10 Marks)**
   b. Write C/C++ program to read 10 characters form the file "vtu.txt" and display/print. Skip next 5 characters and again read 10 characters and print/display. **(06 Marks)**
   c. Write C/C++ program rename old file name to the new file name using appropriate API.
   (04 Marks)

Module-3

5 a. Write a C/C++ program to create a child process and display HELLO VTU in parent space and HELLO VTU BELGAUM in child space. (04 Marks)

   b. Explain with neat depiction how a C program is started and terminated in various ways. (10 Marks)

   c. Write a C/C++ program to illustrate how to avoid Zombie process creation. (06 Marks)

OR

6 a. What is job control? List and explain three forms of support needed for job control with neat diagram. (10 Marks)

   b. What is the use of 'setjmp' and 'longjmp' function? Explain with an example program. (10 Marks)

Module-4

7 a. Explain the term 'signal' and 'signal mask' along with their prototype in detail. (08 Marks)

   b. Write C/C++ program to illustrate the use of 'sigaction'. (06 Marks)

   c. Explain kill( ) API and alarm( ) API in brief. (06 Marks)

OR

8 a. What is error logging? With neat diagram discuss the error logging facility in BSD. (10 Marks)

   b. Discuss Daemon characteristics and coding rules in detail. (10 Marks)

Module-5

9 a. What are pipes? What are their limitations? Write a C program that sends "hello world" message to the child process through the pipe. The child on receiving this message should display it on the standard output. (06 Marks)

   b. With a neat block diagram, explain how FIFO can be used to implement client server communication model. (05 Marks)

   c. Discuss different API's used in message queues along with their prototype. (09 Marks)

OR

10 a. What is Semaphore? Explain semget( ), semctl( ) and semop( ) API's in detail. (10 Marks)

   b. What is shared memory? Discuss different API's used in shared memory along with their prototype. (10 Marks)

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