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06CS62

Sixth Semester B.E. Degree Examination, May/June 2010
UNIX Systems 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. What are the major differences between ANSI 'C' and K and R 'C'? Explain with examples. **(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. **(08 Marks)**

c. What is POSIX API? Why is calling an API more time consuming than calling a user function? **(04 Marks)**

2 a. Explain the different file types available in UNIX or POSIX systems. **(08 Marks)**

b. Discuss with a neat diagram the different data structures supported by UNIX Kernel for file manipulation. **(08 Marks)**

c. Bring out the differences between hard link and symbolic link. **(04 Marks)**

3 a. Explain the following APIs along with their prototype definitions :
i) Open ; ii) Write ; iii) Fcntl ; iv) Fstat. **(08 Marks)**

b. What are symbolic link file APIs? Write a C/C++ program to emulate the UNIX Ln command. **(08 Marks)**

c. Give the hierarchy structure of the file classes. **(04 Marks)**

4 a. Write a C/C++ program to demonstrate the use of atexit function. **(10 Marks)**

b. Explain briefly the memory layout of C program. **(10 Marks)**

PART – B

5 a. What is fork and vfork? Explain with a program for each. **(10 Marks)**

b. What is a controlling terminal? Explain its characteristics and relation to session and process groups. **(10 Marks)**

6 a. What is a signal? Explain with a program how to set up a signal handler. **(10 Marks)**

b. What is a daemon process? Explain daemon characteristics and basic coding rules. **(10 Marks)**

7 a. Explain how FIFO is used in JPC. Discuss with an example the client – server communication using FJFO. **(10 Marks)**

b. Explain popen and pclose functions with prototypes and write a program to demonstrate popen and pclose functions. **(10 Marks)**

8 a. Explain socket addressing, socket creation, connection establishment and data transfer with appropriate APIs. **(10 Marks)**

b. What are send and recv socket calls? Explain various flags used with send and recv calls. **(10 Marks)**

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06CS62

Sixth Semester B.E. Degree Examination, December 2010
Unix Systems Programming

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. Programs must be neatly documented.

PART – A

1 a. Write the difference between K & R C and ANSI C. **(03 Marks)**

b. What do you mean by term feature test macros? List all the test macros along with their meaning. **(06 Marks)**

c. Write a C++ program to list the values of the following system configuration.
i) Maximum number of files which can be opened simultaneously.
ii) Maximum number of real time signals.
iii) Maximum value assignable to a semaphore. **(06 Marks)**

d. What is an inode? Why are inode unique only within a file system? How does OS maps inode to its file name? **(05 Marks)**

2 a. Discuss the various file types in UNIX or POSIX system. **(05 Marks)**

b. What are the API common characteristics? List any five values of global variables errno along with their meaning whenever API fails. **(06 Marks)**

c. List the difference between hard link and symbolic link. **(04 Marks)**

d. Explain the unix Kernel support for files, with a neat diagram. **(05 Marks)**

3 a. With the help of prototype, explain the following API's :
i) creat
ii) lseek
iii) access
iv) link. **(05 Marks)**

b. List the structures used to quarry the file attribute in UNIX. Write C++ program to list the following file attributes of given regular file passed as command line argument.
i) File type
ii) user ID
iii) file name
iv) File size. **(08 Marks)**

c. What is the importance of locking files? What are the mandatory and advisory locks? Why is advisory lock considered safe? What are the draw-backs of advisory lock? Explain. **(07 Marks)**

4 a. With a neat diagram, explain the memory layout of C program. **(07 Marks)**

b. What do you mean by command line argument? Explain with an example. **(03 Marks)**

c. Explain the following, with an example : i) setjmp and longjmp ; ii) setrlimit and getrlimit. **(04 Marks)**

d. What are the different ways in which a process can terminate? Explain with a neat diagram. **(06 Marks)**

PART – B

5 a. What is a job control? What are the three forms of support from the OS required for job control? **(05 Marks)**

b. Explain the special feature of fork API, with suitable example. **(07 Marks)**

c. What is a session? How do you create a session using appropriate shell command? **(05 Marks)**

d. Explain the six different forms of exec API. **(03 Marks)**

6 a. What is the signal mask? Explain with prototype and example. **(05 Marks)**

b. With a neat diagram, explain the method of error logging. **(07 Marks)**

c. What are daemon processes? List their characteristics. Write the rules to code a daemon. **(08 Marks)**

7 a. What do you mean by pipes? List out their limitations. Write a C program that sends "Hello World" message to child process through the pipes. **(06 Marks)**

b. What is the purpose of message queuing? List and explain message queuing with prototype. **(08 Marks)**

c. What are the three different ways in which client and server process can get access to same IPC structure? Explain with different prototypes. **(06 Marks)**

8 a. What is a socket? Describe the socket options. Explain with suitable functions. **(08 Marks)**

b. Write short notes on the following :

i) Race conditions
ii) POSIX.1 FIPS standard
iii) Device file API's
iv) Semaphores. **(12 Marks)**

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