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10CS62

Sixth Semester B.E. Degree Examination, July/August 2022
Unix System Programming

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. What are the major differences between ANSIC and K and RC? Explain with an example for each. **(08 Marks)**

b. Explain POSIX standard. Explain the different subsets of POSIX standard. **(06 Marks)**

c. Explain the common characteristics of API and describe atleast four error status code with their meanings. **(06 Marks)**

2 a. Explain different file types available in UNIX/POSIX system with commands that can be used to create the file types. **(10 Marks)**

b. What are inodes? Why they are unique in a system? How does UNIX maps file names to inodes. **(05 Marks)**

c. List the steps involved in closing of a file with respect to updating of data structure maintained by the UNIX Kernel. **(05 Marks)**

3 a. Write a C/C++ program to read 125 bytes from the file "input.txt" then write the same bytes read to the console using the standard output file descriptor maintained by the O.S. **(05 Marks)**

b. Explain the prototypes of following API's i) umask ii) lseek iii) access iv) ehmod. **(08 Marks)**

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

4 a. Explain with a neat diagram, how a C-program is started and terminated in various ways? Also, with the help of a program demonstrate the use of at exit function to register the exit handlers? **(10 Marks)**

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

c. What are command line arguments? Explain with an example program. **(03 Marks)**

PART – B

5 a. Explain fork and rfork system call with an example program. **(08 Marks)**

b. What is zombie process? How can a zombie be avoided? Explain. **(06 Marks)**

c. What is job control? Explain with a neat diagram the features of job control. **(06 Marks)**

6 a. What is signal? List any four POSIX defined signals with their meaning? Write a program to setup signal handler for SIGINT and SIGALRM signals. **(10 Marks)**

b. What is Daemon process? Explain the coding rules to create a daemon process. Write a C/C++ program to create a daemon process. **(10 Marks)**

7 a. What are the three different ways in which client and server process can get access to same IPC structure? Explain different prototypes that support these structures. **(07 Marks)**

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

c. What are pipes? What are their limitations? **(03 Marks)**

8 a. What are Semaphores? What is their purpose? List and explain the API's used to create and control semaphores. **(05 Marks)**

b. Write short notes on any three of the following :
i) Race condition ii) Error logging facility in BSD Unix iii) Shared Memory iv) Stream pipes. **(15 Marks)**

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