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Sixth Semester B.E. Degree Examination, Jan./Feb. 2023

Unix System Programming

Max. Marks:100

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

PART – A

- 1 a. We know that calling APIs is more time consuming than calling library function. Why? Explain. (05 Marks)
- b. List any six error codes/error status codes returned by APIs with their meaning. (05 Marks)
- c. Explain the different functions to query the system-wide limits. Write a C program to demonstrate how to use these functions to query the limits. (10 Marks)
- 2 a. Write a C/C++ POSIX compliant program to check the following limits:
 - (i) No. of clock ticks
 - (ii) Max. no of child processes
 - (iii) Max. path length
 - (iv) Max. no. of characters in a file name
 - (v) Max. no. of open files/processes. (10 Marks)
- b. Differentiate between hard link and symbolic links. (04 Marks)
- c. Explain UNIX kernel support for files with a neat diagram. (06 Marks)
- 3 a. Explain the following file APIs with their prototypes:
 - i) fcntl
 - ii) lseek
 - iii) open
 - iv) read (12 Marks)
- b. What are the File locking systems? Write a C/C++ program to demonstrate the use of File locking. (08 Marks)
- 4 a. What are the fork and vfork? Write a C/C++ program in which a parent process creates a child process. (10 Marks)
- b. Explain the use of wait() and waitpid() functions with their prototypes. Further explain the UNIX kernel support for processes with a neat diagram. (10 Marks)

PART – B

- 5 a. In addition to process ID, there are other identifiers for every process. Explain the functions that return these identifiers. (06 Marks)
- b. Write a C/C++ program to illustrate the Race Conditions. (08 Marks)
- c. Explain the concept of File Sharing with a neat diagram. (06 Marks)
- 6 a. Discuss the signal concept. Explain any five signals briefly. (08 Marks)
- b. What are Daemon Processes? Explain the basic rules to coding a daemon prevent unwanted interactions from happening. (12 Marks)
- 7 a. What is a pipe list the limitations of pipes? Write a C/C++ program in which a parent process sends a message "I am Google" and child process replies "I am your child, Gmail" over a pipe. (10 Marks)
- b. Explain the different APIs used with message queues. What is a Message Queue? (10 Marks)
- 8 a. Explain Client-Server communication using a FIFO. (10 Marks)
- b. With short notes :
 - (i) Zombie Processes
 - (ii) Semaphores (10 Marks)

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(10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.