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10CS62

**Sixth Semester B.E. Degree Examination, June/July 2023**  
**Unix System 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 is the need for standardization of unix C and programming languages? Bring out major difference between ANSI C & K & R 'C' with examples. (10 Marks)
- b. Write a C/C++ POSIX compliant program to check the following limits :
  - (i) Number of clock ticks.
  - (ii) Maximum number of child processes.
  - (iii) Maximum path length.
  - (iv) Maximum characters in a file name.
  - (v) Maximum number of open files per process. (06 Marks)
- c. Explain any 4 error status codes. (04 Marks)
- 2 a. Explain the different file types available in Unix or Posix systems. Give some commands to create each of them. (10 Marks)
- b. Discuss with a neat diagram, the kernel support for files and also the data structures it maintains for its files. (08 Marks)
- c. List all the file attributes. (02 Marks)
- 3 a. Explain the following API's along with their prototype definitions :
  - (i) Open
  - (ii) fStat
  - (iii) lSeek
  - (iv) mknod (08 Marks)
- b. Explain howfcntl API can be used for file and record locking. (08 Marks)
- c. Give the hierarchy structures of the file classes. (04 Marks)
- 4 a. Explain briefly the memory layout of C program. (05 Marks)
- b. What are Setjmp ( ) and longjmp ( ) function? Explain with a program of their usage. (10 Marks)
- c. What is race condition? Write a C/C++ program to illustrate Race condition. (05 Marks)

**PART – B**

- 5 a. What is job control? Explain job control features with the help of a neat diagram. (10 Marks)
- b. Giving the prototype, explain different variants of Exec system calls. (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.

- 6 a. What is Signal? Discuss any five POSIX defined signals. Explain how to setup a signal handler. (10 Marks)
- b. Discuss deamon characteristics and coding rules. (10 Marks)
- 7 a. Explain how FIFO's are used in IPC. Discuss with a example client/server communication using FIFO. (10 Marks)
- b. Explain different calls available to create and manipulate semaphores. (05 Marks)
- c. Explain popen( ) and pclose( ) functions with their prototypes. (05 Marks)
- 8 a. What is shared memory concept? How it is used for implementation of IPC with an example. (10 Marks)
- b. Explain the following :
- (i) Passing file descriptors between processes.
  - (ii) Client-server communication functions. (10 Marks)

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