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10CS62

Sixth Semester B.E. Degree Examination, June/July 2017
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 ANSI 'C' and K and R 'C'? Explain with examples. **(07 Marks)**

b. Write 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 number of characters in a filename. **(07 Marks)**

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

2 a. Differentiate between C stream pointers and file descriptors. **(04 Marks)**

b. Explain the UNIX kernel support for files with a neat diagram. **(10 Marks)**

c. Differentiate between hard links and symbolic links with examples. **(06 Marks)**

3 a. What is an API? Explain why calling an API is more time – consuming than calling a user – defined function. **(04 Marks)**

b. Explain the following API's with prototypes : i) open ii) lseek iii) fcntl. **(12 Marks)**

c. Write a C/C++ program to emulate *ln* command in UNIX. **(04 Marks)**

4 a. With a neat diagram, explain the memory layout of a C program for the given C program, identify the various segments when the program is executed :

```
#include <stdio.h>
int a = 5; int b ; int data[10] ;
const int i = 5;
int main( )
{
 int x;
 char *ptr = malloc(50);
 return 0;
 }
```

(10 Marks)

b. Explain in detail with prototypes the C functions for memory allocation. **(07 Marks)**

c. Mention the rules to change the resource limits. **(03 Marks)**

PART – B

5 a. What is a race condition? Write the program for generating race condition and to avoid the race condition. **(08 Marks)**

b. In UNIX, explain the freopen function. Write a C/C++ program to implement the freopen function. **(08 Marks)**

c. What is job control? What are the three forms of support from the OS required for job control? **(04 Marks)**

6 a. What is a signal? Discuss any five POSIX–defined signals. Explain how to set up a signal handler. **(10 Marks)**

b. What are daemon processes? List their characteristics. Write a program to transform a normal user process into a daemon process. Explain every step in the program. **(10 Marks)**

7 a. What is FIFO? Explain how it is used in IPC. Discuss with an example, the client–server communication using FIFOs. **(10 Marks)**

b. What are semaphores? What is their purpose? List and explain the APIs used to create and control the semaphores. **(10 Marks)**

8 a. Which is the fastest form of IPC? Explain. **(10 Marks)**

b. Explain STREAMs – based pipes. Write a C function that is used by a server to wait for a client's connect request to arrive. **(10 Marks)**

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