

--	--	--	--	--	--	--	--	--	--

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)
