USN | | | | | | | | | | |

10CS62

Sixth Semester B.E. Degree Examination, Aug./Sept. 2020
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 are the major differences between ANSI C and K and R'C'? Explain each with example. **(08 Marks)**

b. Write a C/C++ program to check the POSIX defined system configuration limits.
   i) Maximum number of characters allowed in a filename
   ii) Maximum number of links a file may have
   iii) Maximum capacity in bytes of a terminals input queue. **(03 Marks)**

c. Describe the characteristics of FIPS standard. **(05 Marks)**

d. Explain the meaning of the following error status codes :
   i) EACCESS
   ii) EAGAIN
   iii) EINTR
   iv) EPERM **(04 Marks)**

2 a. Explain directory file APIs with their prototypes. Write the snippet of code to show that the function is portable to the BSD Unix and to other versions of Unix for directory browsing. **(05 Marks)**

b. What are inodes? Differentiate between hard link and symbolic link. **(06 Marks)**

c. Explain a neat diagram the UNIX kernel support for files. **(06 Marks)**

d. Explain the following APIs with their prototype definitions and return values.
   i) stat ii) chown iii) ℓseek **(03 Marks)**

3 a. Write a C/C++ program to emulate the UNIX mv-command. **(06 Marks)**

b. Explain the significance of locking files? What are mandatory and advisory locks? Why is advisory lock considered to be safe? Explain atleast one drawback of each of these locks. **(10 Marks)**

c. Explain the following flags of fcntℓ API.
   i) F_GETFL ii) F_SETFL iii) F_SETFD iv) F_DUPFD. **(04 Marks)**

4 a. Write a C/C++ program to demonstrate the usage of at exit function. **(05 Marks)**

b. Explain the functions useful in handling the error and interrupts encountered in a low-level subroutine of a program in UNIX. **(04 Marks)**

c. Explain with a neat diagram the memory layout of a C – program. **(06 Marks)**

d. Explain with a neat block diagram the various ways a normal C-program can terminate. **(05 Marks)**

PART – B

5 a. Explain fork API with an example. **(06 Marks)**

b. What is a controlling terminal? Explain its characteristics and relation to session and process groups. **(10 Marks)**

c. Explain system function with its prototype and example. **(04 Marks)**

6 a. What is signal mask? Explain with its prototype and example. **(05 Marks)**
b. What are Daemon processes? List their characteristics and rules to code daemon. **(08 Marks)**
c. Explain the meaning of the following signals
i) SIGALRM ii) SIGCHLD iii) SIGINT. **(03 Marks)**
d. Explain the alarm function with its prototype. **(04 Marks)**

7 a. What are pipes? Write a C/C++ program to create a pipe from the parent to the child and send the data down the pipe. **(07 Marks)**
b. What are message queues? Write the structure of the message queue and explain each member of the structure. **(08 Marks)**
c. Explain kernel support for semaphores. **(05 Marks)**

8 Write short notes on the following :
a. Stream pipes
b. Client – Server properties
c. FIFOs in IPC
d. Race conditions. **(20 Marks)**

* * * * *