USN ☐☐☐☐☐☐☐☐☐☐   **15CS744**

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
UNIX System Programming

Time: 3 hrs.   Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Discuss the major differences between ANSIC and K and R C with examples. **(08 Marks)**
   b. Write a C/C++ POSIX compliant program that prints the POSIX defined configuration options supported on any given system using feature test macros. **(08 Marks)**

OR

2 a. What are the API common characteristics? List any six values of the global variable 'errno' along with their meanings. **(08 Marks)**
   b. Write a C/C++ program to check the following compile time limits, along with its minimum value.
       i)   Supplemental groups
       ii) Maximum number of likes of a file
       iii) Number of simultaneous Asynchronous I/O
       iv) Maximum Number of child processes. **(08 Marks)**

Module-2

3 a. Explain the different type of files in UNIX. **(06 Marks)**
   b. List and explain all the attributes of UNIX or POSIX file with their meaning. Which attributes remain unchanged for entire life of the file? **(06 Marks)**
   c. Differentiate between stream pointers and File Descriptions. **(04 Marks)**

OR

4 a. Explain the following APIS with prototypes. i) open ii) $lseek$ iii) utime. **(08 Marks)**
   b. Consider the following program and its output

```
int main ( )
{
    struct stat filestat ;
    lstat ("/dev/tty4", &filestat);
    printf("%0\n", filestat.st_mode);
    printf("%d\n", filestat.st_rdev);
    return 0 ;
}
OUTPUT :
        27657
        1028
```

What attributes of a file can be extracted using output of the program and demonstrate how? **(08 Marks)**

Module-3

5 a. Explain with a neat diagram how a C – program is started and terminated in various ways. **(05 Marks)**
   b. With a neat sketch, explain the memory layout of a C-program. **(05 Marks)**
   c. What is a race condition? Write a program for generating race condition. **(06 Marks)**

OR

6
a. List and briefly explain various 'exec' functions with prototypes. (06 Marks)
b. Summarize the job control features with the help of neat diagram. (08 Marks)
c. Explain differences between fork( ) and vfork( ) (02 Marks)

Module-4

7
a. What are signals? List any four signals along with brief explanation. (05 Marks)
b. What is signal mask of a process? Explain sigprocmask( ) function along with its prototype. (06 Marks)
c. Discuss the different events that may accur when a parent process receive SIGCHLD signals. (05 Marks)

OR

8
a. Explain alarm API with its prototype. Also write a program to implement. Sleep API using alarm API. (06 Marks)
b. How POSIX.1b timers are different than UNIX timers. (04 Marks)
c. Define daemon process. Discuss the basic coding rules of the daemon process. (06 Marks)

Module-5

9
a. What are pipes? Explain the different ways to view a half duplex pipe. Write a program to create a pipe to send data from parent process to child process. (10 Marks)
b. Explain client/server communication using FIFO with neat diagrams. (06 Marks)

OR

10
a. Explain different APIS used with message Queues. (08 Marks)
b. Explain the following functions with corresponding prototypes.
i) shmget ( )
ii) shmctl ( ) (08 Marks)

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