CBCS SCHEME

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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.***

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.

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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