CBCS SCHEME

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

17CS744

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023
UNIX System Programming

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What are the major differences between ANSIC and K&R C? Explain in details with example. **(08 Marks)**

b. Write the usages and prototype of sysconf( ) and pathconf( ) APIs. Write a C/C++ program to check the following limits:
i) Max number of Childs per process.
ii) Max number of open files per process.
iii) Clock tick per second.
iv) Max number of characters in filename. **(08 Marks)**

c. Explain the different POSIX sub standards and their features. Write a C/C++ program to check and display the POSIX version. **(04 Marks)**

OR

2 a. What are different POSIX feature test macros? Write a C/C++ program to check for POSIX feature test macros. **(10 Marks)**

b. Explain the common characteristics of APIs and list the commonly occurring error status codes with their meanings. **(06 Marks)**

c. What are features mandated to be implemented in POSIX.1FIPS conforming system? **(04 Marks)**

Module-2

3 a. Explain the different file types and their attributes in UNIX. **(07 Marks)**

b. How UNIX kernel support for files? Explain it with related data structures. **(08 Marks)**

c. Why hard link is needed in UNIX? Differentiate hard links with symbolic link. **(05 Marks)**

OR

4 a. Explain the following APIs with prototype: i) open( ) ii) write( ) iii) lseek( ). **(09 Marks)**

b. Write a note on record and file locking. Show the use of fcntl( ) function in record locking with the structure definition of flock. **(07 Marks)**

c. Write a C/C++ program to implement UNIX "*l*n" command. **(04 Marks)**

Module-3

5 a. Explain the different process termination ways. Explain the exit( ) and _exit( ) functions with their effects on main function. **(06 Marks)**

b. Why setjmp and longjmp functions are used? Illustrate their usages with simple program. **(06 Marks)**

c. Differentiate between wait and waitpid APIs. List and explain the macros defined by POSIX.1b to check how a process is terminated. **(08 Marks)**

OR

6 a. Write different exec functions with their prototypes and relationships. (06 Marks)
b. Illustrate the steps involved in terminal login, in details. (07 Marks)
c. What is a job? How job control is implemented in UNIX systems? (07 Marks)

Module-4

7 a. How UNIX kernel support for the signals? (05 Marks)
b. Explain the following APIs with prototype relating signals:
i) sigprocmask( ) ii) sigaction( ) iii) alarm( ). (09 Marks)
c. Explain the relationship between SIGCHLD and waitpid( ) API. (06 Marks)

OR

8 a. Explain the way a process can send a signal to a process or a process group. (06 Marks)
b. What are daemon processes? Explain the coding rules a daemon process. (08 Marks)
c. Explain the error logging facility for daemon process, with neat diagram. (06 Marks)

Module-5

9 a. List different IPC mechanisms and explain the communication using FIFO with neat diagram. (07 Marks)
b. What are semaphores? Write and explain the following APIs:
i) semget( ) ii) semctl( ) (09 Marks)
c. Explain the benefits of popen( ) and pclose( ) in detail. (04 Marks)

OR

10 a. Explain the message queue and write and explain the prototype of following APIs:
i) msgget( ) ii) msgrcv( ) iii) msgctl( ) (10 Marks)
b. Explain the different client server connection functions. (06 Marks)
c. Write a C/C++ program to transfer the data between parent and child process over a pipe. (04 Marks)

* * * * *