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

16CS/IS51

Fifth Semester B.E. Makeup Examination, January 2020

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Answer any five questions by selecting at least one from each Unit.*
2. *Draw the neat diagrams wherever needed.*

UNIT - I

			L	CO	PO	M
1	a.	Write a note on UNIX, POSIX and ANSI standards	(2)	(1)	(1)	(06)
	b.	Differentiate K&R C an ANSI C	(3)	(1)	(1)	(10)
	c.	Write a C program to test the presence of ANSI C.	(2)	(1)	(3)	(04)

OR

2	a.	Write a C program to test at least five feature test macros and explain them in brief.	(2)	(1)	(1)	(10)
	b.	Write a C/C++ program to check four runtime limits for system-wide configuration and four runtime limits for file related configuration.	(2)	(1)	(3)	(10)

UNIT – II

			L	CO	PO	M
3	a.	List and explain the UNIX supported file types	(2)	(1)	(1)	(10)
	b.	Write a C/C++ program to display user visible file attributes using appropriate file structure	(4)	(1)	(3)	(10)

OR

4	a.	With neat diagram demonstrate the support of files by UNIX kernel	(2)	(1)	(1)	(10)
	b.	Write a C/C++ program to provide a Write lock on last 100B of file. Demonstrate the child and parent process to contend for write locking the same region.	(4)	(1)	(3)	(10)

UNIT – III

			L	CO	PO	M
5	a.	Explain with syntax exit and atexit function along with the block diagram of start and termination of C program.	(2)	(3)	(1)	(10)
	b.	What is the use of setjmp and longjmp functions? Illustrate with a simple program	(2)	(3)	(2)	(10)

OR

6	a.	Explain the memory layout of C program in detail along with a neat diagram.	(2)	(3)	(1)	(10)
	b.	Explain environment list with a neat diagram. Write a program to echo all command line arguments to standard output.	(2,3)	(3)	(2)	(10)

UNIT - IV

			L	CO	PO	M
7	a.	Write a note on UNIX kernel support for signals	(2)	(3)	(1)	(07)
	b.	Explain the Error logging facility and client server model for daemon processes	(2)	(3)	(1)	(08)

	c.	Write a C/C++ program to demonstrate the implementation of signal using POSIX sigaction.	(4)	(3)	(3)	(05)
		OR					
8	a.	Demonstrate with a sample C/C++ program the use of signal masks, sigsetjmp, and siglongjmp.	(3)	(3)	(3)	(10)
	b.	State the coding rules of daemon processes	(1)	(3)	(1)	(05)
	c.	Demonstrate the use of alarm to implement sleep API	(3)	(3)	(3)	(05)
		UNIT -V	**L**	**CO**	**PO**	**M**
9	a.	Demonstrate the two way communication between child and parent using PIPE.	(3)	(2)	(1)	(10)
	b.	Explain shmget and shmctl functions in detail	(2)	(2)	(1)	(10)
		OR					
10	a.	With a neat diagram explain the working of client-server model using FIFOs	(2)	(2)	(1)	(10)
	b.	Elucidate msgget, msgsnd and msgctl as applicable to message queues	(2)	(2)	(1)	(10)

5th Sem ISE CS - 4 Set

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

16CS/IS51

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Answer any one question from each unit.*
2. *Draw a neat diagram wherever applicable.*

			L	CO	PO	M
		UNIT - I				
1	a.	Distinguish between ANSI C and K&R C with example & write a C/C++ program to display the _POSIX_VERSION constant.	(2)	(1)	(2)	(10)
	b.	Write a C/C++ program to illustrate the use of sysconf, pathconf, fpathconf for the following limit values: Maximum number of message queues per process, real time signals, links a file may have, length in bytes of a path name, & size of a block of data that may be automatically read from or written to a pipe file.	(3)	(1)	(2)	(10)
		OR				
2	a.	Write a C/C++ program that prints the POSIX-defined configuration options supported on any given system.	(3)	(1)	(2)	(10)
	b.	Discuss any five POSIX.1-defined constants and POSIX.1b-defined constants.	(2)	(1)	(1)	(10)
			L	CO	PO	M
		UNIT – II				
3	a.	Explain the different file types available in UNIX/POSIX system.	(1)	(2)	(1)	(10)
	b.	Discuss with a neat diagram the different data structures supported by Unix Kernel for files.	(2)	(2)	(1)	(10)
		OR				
4	a.	Explain the different file attributes available in UNIX/POSIX system	(2)	(2)	(1)	(10)
	b.	Discuss the concept of File and Record Locking. Write a pseudo code for employee details file containing 1000 bytes of data. File contains confidential information from 600th byte to 900th byte, Currently file pointer is pointing to 200th byte. Move the file pointer to 600th position and apply the write lock to the next 300 bytes.	(3)	(2)	(2)	(10)
			L	CO	PO	M
		UNIT - III				
5	a.	Explain eight different ways of process termination	(2)	(1)	(1)	(07)
	b.	Briefly explain UNIX kernel support for processes.	(1)	(1)	(1)	(07)
	c.	Write a C/C++ program to print at least 5 current resource limits	(3)	(1)	(3)	(06)
		OR				
6	a.	With the neat diagram explain the memory layout of C program.	(2)	(1)	(1)	(10)
	b.	Write a C/C++ program to demonstrate three different ways of accessing the environment variables.	(4)	(1)	(3)	(10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

			L	CO	PO	M
		UNIT - IV				
7	a.	Define the term signal along with the ways a process can react to pending signals. Discuss any five signals along with its use.	(2)	(4)	(1)	(10)
	b.	What are daemon processes? Explain the BSD syslog facility adopted by daemon processes for error handling with a neat diagram and list the various function prototypes.	(2)	(4)	(1)	(10)
		OR				
8	a.	Discuss kill and alarm APIs in detail.	(2)	(4)	(1)	(10)
	b.	Explain in detail the basic rules to code a daemon process.	(2)	(4)	(1)	(10)
			L	CO	PO	M
		UNIT -V				
9	a.	What are pipes? Explain the different ways to view a half duplex pipe. Write a program to show data transfer between parent and its child using pipe.	(2,3)	(5)	(2)	(10)
	b.	Explain the concept of Co-processes and Shared memory.	(2)	(5)	(1)	(1
		OR				
10	a.	What is FIFO? Discuss with an example, the client-server communication using FIFO.	(2)	(5)	(1)	(10)
	b.	What is meant by Semaphores and Message queue? Discuss the structure of both in detail	(2)	(5)	(1)	(10)

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

1 Set CS

16CS51/15IS51/16IS51

Fifth Semester B.E. Fast Track Semester End Examination, July/August 2019

UNIX SYSTEM PROGRAMMING

Time: 3 Hours Max. Marks: 100

Instructions: 1. *UNIT I and UNIT II are compulsory. Answer at least five questions by selecting at least one question from each other UNIT.*
2. *Draw the figure/ diagram compulsorily wherever necessary.*

UNIT – I (Compulsory)

			L	CO	PO	M
1	a.	Differentiate the KR-C with ANSI C.	(3)	(1)	(1)	(10)
	b.	List and explain at least 5 compile time and runtime limit checking macros.	(2)	(1)	(1)	(10)

UNIT – II (Compulsory)

			L	CO	PO	M
2	a.	Explain the different file types as supported by UNIX operating systems.	(2)	(1)	(1)	(10)
	b.	Demonstrate the UNIX kernel support for files.	(3)	(1)	(2)	(10)

UNIT - III

			L	CO	PO	M
3	a.	Write a note on memory layout of a C Program	(2)	(1)	(2)	(10)
	b.	Elucidate on UNIX kernel support for processes.	(2)	(1)	(1)	(10)

OR

4	a.	Demonstrate the use of setjmp and longjmp functions along with a C program	(3)	(1)	(3)	(10)
	b.	What are environment variables? Write a C program to query them using any of the three methods	(3)	(1)	(3)	(10)

UNIT - IV

5	a.	Write a note on UNIX kernel support for SIGNALS	(2)	(3)	(1)	(10)
	b.	Explain the WAITPID API along with a sample C program	(2)	(3)	(1)	(10)

OR

6	a.	What is a daemon process? Explain the error logging facility of Daemon processes.	(2)	(3)	(1)	(10)
	b.	Demonstrate the sigsetjmp and siglongjmp functions with an example	(3)	(3)	(1)	(10)

UNIT -V

			L	CO	PO	M
7	a.	What are pipes in UNIX? Write a C program to demonstrate its use for client server communication	(2)	(2)	(3)	(10)
	b.	Explain popen and pclose functions as applicable to IPC's in UNIX.	(2)	(2)	(3)	(10)

OR

8	a.	Demonstrate the use of message queues using API's	(3)	(2)	(1)	(10)
	b.	Demonstrate the use of semaphores using API's to manipulate them.	(2)	(2)	(1)	(10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

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

16CS/IS51

Fifth Semester B.E. Makeup Examination, January 2019

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Unit I and Unit II are Compulsory.*
2. *Answer any one FULL question from remaining each Unit.*

			L	CO	PO	M
		UNIT - I				
1	a.	List the differences between ANSI C and C++. Explain each with example.	(2)	(1)	(1)	(06)
	b.	What are POSIX standards? Explain different subsets of POSIX standard. Write a C/C++ program to check and display the version of a POSIX.	(3)	(1)	(3)	(07)
	c.	What do you understand by term feature test macros? Write a C / C++ program for POSIX feature test macros.	(3)	(1)	(1)	(07)
			L	CO	PO	M
		UNIT – II				
2	a.	Explain the UNIX kernel support for files with a neat diagram.	(2)	(1)	(1)	(10)
	b.	Mention the different file types available in UNIX / POSIX system along with commands to create them.	(2)	(1)	(3)	(10)
			L	CO	PO	M
		UNIT - III				
3	a.	With a neat diagram, explain the memory layout of c program.	(2)	(1)	(3)	(08)
	b.	Explain the various dynamic memory allocation techniques in UNIX along with the prototype.	(2)	(2)	(1)	(06)
	c.	What are environment variables? Write a C/C++ program that outputs the contents of its environment list.	(3)	(1)	(1)	(06)
		OR				
4	a.	Write a note on getrlimit and setrlimit functions along with their prototype.	(2)	(1)	(3)	(04)
	b.	Describe the UNIX Kernel support for process with a neat diagram.	(2)	(1)	(12)	(10)
	c.	With an example explain the use of setjmp and longjmp functions.	(2)	(1)	(1)	(06)
			L	CO	PO	M
		UNIT - IV				
5	a.	What are signals? Write a program to setup signal handler for the SIGINT signal using sigaction API.	(3)	(3)	(3)	(08)
	b.	Explain the following API's along with their prototypes with respect to signals. i) sigprocmask ii) sigaction iii) alarm iv) kill	(2)	(3)	(1)	(12)

OR

6	a.	What are Daemon processes? Explain the various coding rules of a Daemon process.	(2)	(3)	(1)	(10
	b.	Explain with a neat diagram the error logging facility for a daemon process.	(2)	(3)	(1)	(10

UNIT -V

			L	CO	PO	M
7	a.	Explain popen and pclose functions along with its prototype.	(2)	(2)	(3)	(06)
	b.	What is FIFO? With a neat diagram, explain how FIFO can be used to implement client-server communication model.	(2)	(2)	(3)	(08)
	c.	Write a note on co-processes with an example program.	(3)	(2)	(3)	(06)

OR

8	a.	Write a short note on the following: i) Message qucues ii) Semaphores	(2)	(2)	(3)	(10)
	b.	Explain the concept of shared memory with an example C/C++ program.	(3)	(2)	(3)	(10)

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

16IS/CS51

Fifth Semester B.E. Semester End Examination Dec/Jan 2018-19

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *UNIT I & II are Compulsory.*
2. *Answer any one full question from remaining each UNITS.*
3. *Write comments for all the programs.*

			L	CO	PO	M
		UNIT - I				
1	a.	List and explain the features by which ANSI C differs from K and R C with an example for each.	(2)	(1)	(1)	(07)
	b.	Write C / C++ POSIX compliant program to check the following limits: i) Number of clock ticks iii) Maximum number of child processes ii) Maximum path length iv) Maximum number of characters in a file name.	(3)	(1)	(3)	(08)
	c.	Explain the common characteristics of API along with error status codes with their meaning.	(2)	(1)	(1)	(05)
		UNIT – II				
2	a.	Explain the different file types available in UNIX or POSIX system along with the commands used for creating and deleting of files.	(2)	(1)	(3)	(10)
	b.	Write a psuedocode for a given Employee.txt file that contains information of all employees. Size of file is 5000 bytes. Employee's confidential data is stored between the regions of 4000 to 5000 byte. Currently file pointer is pointing to 2000^{th} position. Move the pointer to 4000^{th} position and apply the write lock so that other processes cannot access the confidential data stored in that region.	(3)	(1)	(3)	(06)
	c.	List and explain all the attributes of a file along with their meaning.	(2)	(1)	(3)	(04)
		UNIT - III				
3	a.	Explain the various ways of process termination. With a neat diagram explain how a C program is started and how it terminates.	(2)	(1)	(1)	(10)
	b.	What is the **importance** of Environment list in UNIX. Write a C / C++ program to display the entire environment list from the system.	(3)	(1)	(3)	(06)
	c.	Give reasons as to why shared libraries are better, with an example.	(2)	(1)	(1)	(04)
		OR				
4	a.	Explain the need and use of setjmp and longjmp functions along with the syntax. Also, write a program to demonstrate the use of setjmp and longjmp functions.	(3)	(1)	(3)	(10)

	b.	With a neat diagram, explain the memory layout of a C program. Identify the various segments when the following program is executed.
		#include<stdio.h>
		int a=5;
		int b;
		int data[100];
		main( )
		{
		int x;				

```
char *ptr = malloc(50);
}
```

(3) (1) (3) (10)

UNIT - IV

5 a. What are signals? Discuss any five POSIX defined signals.

(2) (3) (3) (07)

b. Explain the following API's related to signal with their prototypes.
i) sigprocmask ii) sigaction iii) sigsetjmp

(2) (3) (3) (06)

c. Briefly explain the kill and alarm API's.

(2) (3) (3) (07)

OR

6 a. What is a daemon process? Discuss its characteristics.

(2) (3) (2) (06)

b. Explain the error logging facility of a daemon process with a neat block diagram.

(2) (3) (3) (08)

c. Write a program to transform a normal user process into a daemon process. Explain the same

(3) (3) (3) (06)

UNIT -V

7 a. Explain client / server communication using FIFO with a neat diagram.

(2) (2) (1) (10)

b. What are pipes? Write a C / C++ program to send data from parent to child over a pipe.

(3) (2) (3) (10)

OR

8 a. Explain different API's used with message queues.

(2) (2) (1) (10)

b. With a simple C program to illustrate the concept of a co-process.

(2) (2) (1) (05)

c. List along with the prototype declaration and meaning, the different types of system calls available to create and manipulate semaphore.

(2) (2) (1) (05)

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

15CS/IS51

Fifth Semester B.E. Semester End Examination, Dec/Jan 2017-18

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Unit- I & Unit-II are compulsory.*
2. *Answer any one full question from remaining units.*

UNIT - I

1 a. What is POSIX? Explain different POSIX standards. **05 M**

(Level [1,2], CO [1], PO [1])

b. Write a C/C++ program to print the POSIX defined configuration options supported on any given system. **10 M**

(Level [3], CO [1], PO [3])

c. Explain the following error status code's **05 M**

i) EACESS
ii) EPERM
iii) ENONET
iv) BADF
v) EINTR

(Level [2], CO [1], PO [1])

UNIT – II

2 a. Explain the different file types available in UNIX or POSIX system. **07 M**

(Level [2], CO [1], PO [1])

b. Suppose a bank balance of a specific customer is saved in a file called "account.txt" from 500^{th} byte to 535^{th} byte. **06 M**

Customer current account balance is 1000 and customer has both Debit card and Online access to same account. Suppose debitCard( ) and online ( ) functions can call a withdraw ( ) function which updates the balance in "account.txt". There are chances that debitCard ( ) and online ( ) functions could make a call to withdraw ( ) function simultaneously.

If the prototype is **int withdraw (int amount),** Implement withdraw ( ) function which returns 0 on success and -1 on failure.

(Level [3], CO [1], PO [3])

c. List all the file attributes along with their meanings. Write the UNIX commands needed to change the following file attributes. **07 M**

i) Hard link count ii) Last access and modification time iii) Changes User ID

(Level [1, 3], CO [1], PO [12])

UNIT – III

3 a. What are the different ways in which process reacts to pending signal? **05 M**

(Level [1], CO [3], PO [1])

b. Explain how kernel is reacting to signal generated for a process. **07 M**

(Level [2], CO [3], PO [1])

c. Write a C/C++ program to catch the SIGTERM signal ignores SIGABRT signal and accepts default action of SIGQUIT signal. **08 M**

(Level [3], CO [3], PO [3])

OR

4 a. Define daemon process. Summarize the basic rules to coding daemon process. **10 M**

(Level [1,2], CO [3], PO [12])

b. Explain SVR4 log facility with a block diagram. **10 M**

(Level [2], CO [3], PO [1])

UNIT – IV

5 a. Explain pipes and their limitations? Write a c program that sends "hello world" message to the child process through the pipe. The child on receiving this message should display it on the standard output. **10 M**

(Level [3], CO [2], PO [3])

b. Define FIFO and explain how FIFO can be used to implement client-server communication model with an example. **05 M**

(Level [1,3], CO [2], PO [3])

c. Discuss the advantages and disadvantages of XSI IPC. **05 M**

(Level [2], CO [2], PO [1])

OR

6 a. Explain the concept of shared memory with an example of C/C++ program. **10 M**

(Level [3], CO [3], PO [3])

b. Write a C program to illustrate the concept of Co-processes. **05 M**

(Level [3], CO [3], PO [3])

c. Explain the msgget( ) and msgctl( ) functions related to message queues. **05 M**

(Level [2], CO [3], PO [1])

UNIT –V

7 a. Write the comparison of various socket address structures with a neat diagram. **05 M**

(Level [3], CO [2], PO [3])

b. Explain the following socket programming functions with their prototypes. **10 M**
i) listen ii) accept iii) bind iv) connect

(Level [2], CO [2], PO [12])

c. List & describe the byte manipulation functions of socket address structure with their prototype **05 M**

(Level [1,2], CO [2], PO [3])

OR

8 a. Explain IPv4 and IPv6 socket address structure with its declaration. **10 M**

(Level [2], CO [2], PO [12])

b. Write a short note on: **10 M**
i) inet_aton, inet_addr and inet_ntoa functions.
ii) getsockname and getpeername functions.

(Level [2], CO [2], PO [1])