KIMATHI UNIVERSITY COLLEGE OF TECHNOLOGY

University Examinations 2010/2011

FIRST YEAR SEMESTER TWO EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE.

ICS 2103 INTRODUCTION TO SYSTEMS PROGRAMMING

DATE: 10TH December 2010 **TIME:** 2.00PM – 4.00PM

INSTRUCTIONS: Answer **Question One** and **Any Other Two** questions

Question 1

(a) Describe the following terms

i. Systems call
ii. Programming API
iii. Communication protocol

[6 marks]

(b) Differentiate between the following terms

i. Programmed IO and interrupted driven IO.
ii. Message queue and shared memory
iii. Socket stream and socket Datagram

[12 marks]

(c) Give function prototype to perform the following tasks, discuss each parameter used in each case.

i. Create a socket
ii. Perform operation on message queue.

[6 marks]

(d) Describe how client processes communicate with server process using socket IPC mechanism. Outline specific socket API on client and server side.

[6 marks]

Question 2

(a) Define the following terms

i. Device controller
ii. Device interface
iii. Buffered IO

[6 marks]

(b) Briefly explain how DMA controller operates.

[6 marks]

(c) Briefly discuss the following memory management schemes.

i. Dynamic portioning and
ii. Segmentation.

[8 marks]

Question 3

(a) Differentiate between the following.

i. File direct and sequential access
ii. Contiguous and linked allocation.
iii. File attribute and file operation mode.

[6 marks]

(b) Write a program which maliciously access file named studentfee.txt and clear all existing content and replace it with your nickname. Explain working of your program.

[12 marks]

Question 4

(a) Differentiate between the following

i. signal and semaphores
ii. pipe and file
iii. Process and thread.

[6 marks]

(b) Give system calls required to create a named pipe call Plink and write to the same. Explain parameters passed to the function.

[8 marks]

(c) Discuss any two techniques which can be applied to address processor and IO speed difference.

[6 marks]

Question 5

(a) List any six message queue information.

[6 marks]

(b) Differentiate between double buffered IO and circular buffered IO.

[6 marks]

(c) Explain how TCP/IP protocol stack implements OSI communication model.

[8 marks]