TECHNICAL UNIVERSITY   **OF MOMBASA**

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INFORMATION AND COMMUNICATION TECHNOLOGY

EIT 4420   **Network Programming**

END OF SEMESTER EXAMINATION

SERIES: 2016/2017

TIME:2 HOURS

DATE: Pick DateSelect MonthPick Year

Instructions to Candidates
You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of 5 questions. Attempt question one(Compulsory) and any other two questions.
Do not write on the question paper.

INSTRUCTIONS: Attempt QUESTION ONE plus ANY OTHER TWO questions.

QUESTION ONE
     iii) .Net remoting
     iv) Sockets
     v) Multithreading
     vi) System calls   (8 marks)

a) Describe any four classes of network protocols   (4 marks)
b) Identify two Memory Management Requirements   (2 marks)
c) Briefly describe and illustrate with diagrams the three Multithreading Models   (6 marks)
d) Briefly describe the two types of (TCP/IP) sockets: (4 marks)
e) Explain the meaning of the following codes involving sockets:
    int status = listen(sockid, queueLimit)   (2 marks)
f) Outline the steps followed by client to establish the connection with a server   (4 marks)

QUESTION TWO

a) Describe at least two of the following operations involving sockets
     i). int status = bind(sockid, &addrport, size);
     ii). int status = listen(sockid, queueLimit);
     iii). int s = accept(sockid, &clientAddr, &addrLen);   (4 marks)

b) Explain the main difference between UTP and UDP in network programming connections, outlining two specific characteristics in each case. (6 marks)
c) Concurrent processing is fundamental to distributed computing and occurs in many forms. State any two of these forms. (2 marks)
d) Briefly describe at least four socket APIs. (4 marks)
e) Distinguish between the following process control system calls:
   i). Fork() and malloc() (2 marks)
   ii). free() and waitpid() (2 marks)

QUESTION THREE
a) Describe three .NET Remoting Components (6 marks)
b) Distinguish between a switch and a bridge. (4 marks)
c) Describe the following categories of system calls and outline at least two examples of system calls commands in each case:
   i). Information management (5 marks)
   ii). Process Control (5 marks)

QUESTION FOUR
a) Explain the main difference between UTP and UDP in network programming connections, outlining two specific characteristics in each case. (6 marks)
b) Outline three ways in which a socket can be uniquely identified: (3 marks)
c) State two problems associated with threads (2 marks)
d) With the aid of a diagram, discuss client-server communication using either TCP or UDP sockets. (9 marks)

QUESTION FIVE
Using C# or VB.NET Write a program that creates a client that connects to a server. The client is built with a synchronous socket, such that the execution of the client application is suspended until the server returns a response. The application sends a sample string to the server and then displays the string returned by the server on the console.   Ensure each line of the code is well documented (Commented) to enhance clarity (Marks 20)