TECHNICAL UNIVERSITY OF MOMBASA

FOET

COMPUTING AND INFORMATICS

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.

Do not write on the question paper.

INSTRUCTIONS: Attempt QUESTION ONE (Compulsory) and ANY OTHER TWO questions.

QUESTION ONE

a) Define the following terms:
   i). Thread
   ii). System calls
   iii) Sockets
   iv) .Net remoting (8 marks)

b) Explain the meaning of any of the following codes involving sockets:
   i). int status = connect(sockid, &foreignAddr, addrlen) (4 marks)
   ii). status = close(sockid) (2 marks)

c) Briefly describe the two types of (TCP/IP) sockets: (4 marks)

d) Describe at least two circumstances under which the following network topologies can be implemented. (4 marks)
   i). Bus
   ii). Mesh

e) Distinguish between a router and a gateway (4 marks)

f) Outline the steps followed by client to establish the connection with a server (4 marks)

QUESTION TWO

a) Describe at least two circumstances under which the following network topologies can be implemented. (4 marks)
   iii). Bus
   iv). Mesh
b) Distinguish between a router and a gateway (2 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() (4 marks)
   ii). free() and waitpid() (4 marks)

QUESTION THREE

Using C# or VB.NET write program that creates a server and receives connection requests from clients. The server is built with a synchronous socket, so execution of the server application is suspended while it waits for a connection from a client. The application receives a string from the client, displays the string on the console, and then echoes the string back to the client. The string from the client must contain the string "<EOF>" to signal the end of the message. Ensure the code is well documented (Commented) to enhance clarity

(Marks 20)

QUESTION FOUR

a) State two problems associated with threads (2 marks)
b) With the aid of a diagram, discuss client-server communication using either TCP or UDP sockets. (18 marks)

QUESTION FIVE

a) Explain the importance of .Net remoting (3 marks)
b) Describe any four classes of network protocols (4 marks)
c) Identify two Memory Management Requirements (2 marks)
d) Briefly describe and illustrate with diagrams the three Multithreading Models (6 marks)
e) Outline three ways in which a socket can be uniquely identified: (3 marks)
f) State two problems associated with threads (2 marks)