



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 Date Select Month Pick 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)