(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY SPECIAL/SUPPLEMENTARY EXAMINATIONS 2021/2022 ACADEMIC YEAR

Supplementary / Special exam

THIRD YEAR EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: BCS 370

COURSE TITLE: NETWORK PROGRAMMING

DATE: MONDAY 1-08-2022   **TIME:** 2:00P.M-4:00P.M

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Attempt any TWO (2) questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating
This Paper Consists of 3 Printed Pages. Please Turn Over.

QUESTION ONE [30 MARKS]

a) Explain the client-server architecture using appropriate diagrammatic example   (5 Marks)

b) Write a program that will accept the host name of a machine and be able to display the InetAddress of that machine use the required factory methods   (5 Marks)

c) Explain briefly TCP and UDP protocols and the difference between the two protocols.

(5 Marks)

d) Discuss the process of creation of server and client sockets with exceptions handled explicitly with a suitable example.   (5 Marks)

e) In the server –client communication socket function are available as depicted in the diagram bellow explain the function from each side of the divide   (10 Marks)
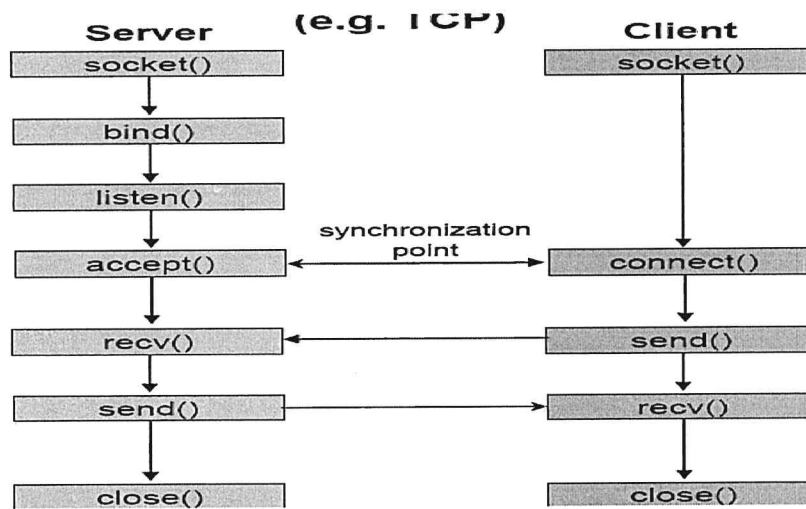
QUESTION TWO [20 MARKS]

a) Explain the following terminologies and how they are used in Java programming   (3 Marks)

    i. Catch
    ii. Try
    iii. finally

b) Explain any FOUR advantages of TCP over UDP communication   (2 Marks)

c) Write a URL-based program that pulls content from www.mmust.ac.ke.   (5 Marks)

d) Write a program that enables two users to chat. Implement one user as the server and the other as the client .The server has two text areas: one for entering text and the other (noneditable) for displaying text received from the client. When the user presses the *Enter* key, the current line is sent to the client. The client has two text areas: one (noneditable) for receiving text from the server, and the other for entering text. When the user presses the *Enter* key, the current line is sent to the server.   (10 marks)

e) Computer networks of any size share some common limitations to varying degrees that must be accounted for in network simulations, with the internet being the most limited in all three regards. Briefly explain three fundamental problems likely to be experienced in any network simulation

(6 Marks)

QUESTION THREE [20 MARKS]

a) Explain the function of the following   (2 Marks)

   i.   DNS

b) Explain the meaning of a port and socket in Network programming   (2 Marks)

c) The java.net.Socket class represents a socket, and the java.net. ServerSocket class provides a mechanism for the server program to listen for clients and establish connections with them. Explain the steps that occur when establishing a TCP connection between two computers using sockets   (8 Marks)

d) Write a Socket-based Java server program that responds to client messages as follows: When it receives a message from a client, it simply converts the message into all uppercase letters and sends back the same to the client. Write both client and server programs to demonstrate (8 Marks)

QUESTION FOUR [20 MARKS]

a) Write a simple program that can read a host name and convert it to an IP address

(6 Marks)

b) Write and explain a syntax to create a server, through a server socket   (4 Marks)

c) Explain the operation of the following network designs

   i.   Client-Server computing   (2 Marks)

   ii.   Peer-to-Peer computing   (2 Marks)

d) State the usage and the port number for the following protocols   (6 Marks)

   i.   SMTP

   ii. Telnet

   iii. FTP

QUESTION FIVE [20 MARKS].

e) Closing sockets is very important aspect. However, it's advisable to always close the input and output streams before closing sockets. Write code construct to close the input, and output streams and socket for:

    i.   Client   (4 Marks)

    ii.   Server   (4 Marks)

f) Explain services offered by: (4 Marks)

    i.   Internet layer

    ii.   Application layer

g) State the usage and the port number for the following protocols.   (6 marks)

    i.   SSH.
    ii.   Time
    iii.   Whois
    iv.   Finger
    v.   NNTP
    vi.   IMAP

h) State any TWO areas where UDP can be very useful   (2 Marks)