TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS & PHYSICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF MATHEMATICS AND COMPUTER SCIENCE

EIT 4354: NETWORK DESIGN AND IMPLEMENTATION

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2HOURS

DATE: Pick Date May 2016

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

Instructions: Answer question one and any other two questions

Question One

a) Differentiate between the following terms
   i) Logical and physical topology (4 marks)
   ii) Static IP address and Dynamic IP Address. (2 marks)
   iii) IPv4 and IPv6 (2 marks)

b) Both Alice and Waithera are using Windows operating system in a network. Alice needs to share a resource by the name VIRAGO with Waithera .
   i) How would Alice go about sharing the resource? (2 marks)
   ii) How would Waithera go about accessing the resource for her computer? (2 marks)
   iii) State one command or away that both Alice and Waithera might use to identify the physical address of their PC's. (2 marks)

c) Highlight four advantages of using wireless media over cable based media. (4 marks)

d) An institution is thinking of implementing a client/server model type of network category and not peer to peer model type of network category. Explain the difference of the two network categories. (4 marks)

e) Highlight any four likely causes of a network connection failure. (4 marks)

f) A network administrator is connecting hosts A and B directly through their Ethernet interfaces, as shown below. Ping attempts between the hosts are unsuccessful. What can be done to provide connectivity between the hosts? (4 marks)
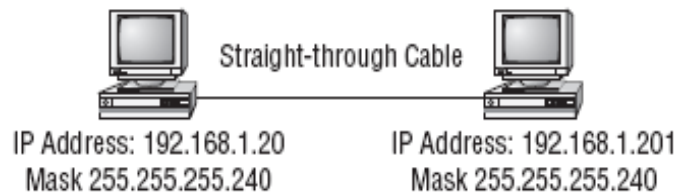
Question two

a) The international Organization for Standardization (ISO) Network Management forum divided network management into five functional areas. Describe the five functional areas of network management. (10 marks)

b) Differentiate between User Datagram protocols (UDP) and Transmission Control Protocol (TCP) protocols. (4 marks)

c) Name one advantage and disadvantage of a star topology. (2 marks)

d) Highlight any four factors to consider when selecting a network adapter card. (4 marks)

Question three

a) Explain the functions of the following devices as used in networking. (10 marks)
   i) Router
   ii) Bridge
   iii) Gateway
   iv) Switch
   v) Repeater

b) Highlight four roles of a network interface card. (4 marks)

c) State and briefly explain three tools for finding errors in a network. (6 marks)

Question four

a) A company is in the process of designing a computer network, knowing you as an expert in this area, they approach you to assist in designing. Describe how you will take them through a Network Design and Implementation Cycle. (14 marks)

b) Highlight two factors to consider when choosing a transmission media (2 marks)

c) What is meant by the term "redundancy" and what is a drawback of building redundancy into a network? (4 marks)

Question five

a) Using a well labeled diagram, explain the roles of each OSI reference model layer in network administration. (12 marks)

b) Technical University of Mombasa wishes to break its class C IP address 195.5.20.0 into as many subnets as possible provided that it can get at least 50 clients per subnet. Find the ranges of valid IP addresses for the first four subnets. (8 marks)