MURANG'A UNIVERSITY COLLEGE

(A Constituent College of Jomo Kenyatta University of Agriculture and Technology)

University Examinations 2015/2016

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

BIT 2116: NETWORK DESIGN AND MANAGEMENT

COURSE: B.Sc. IT	**TIME: 2HRS**
DAY/TIME: Friday 8.30 a.m.	**DATE: 11/12/15**

Instructions: Answer Question 1 and Any Other Two.

QUESTION ONE (30 Marks)

a) With aid of diagrams discuss the OSI reference models, detailing the protocols and network devices that are used in each layer   (14 Marks)

b) As a network design expert you have been tasked to solve the following scenario:

Based on your network design requirements, you have determined that you should use a 26-bit subnet mask applied to your 192.168.0.0/24 network.

   i. Calculate each of the created subnets.   (4 Marks)

   ii. Show the broadcast address and the range of usable addresses for each of the created subnets   (8 Marks)

c) With aid of a diagram describe the process of assigning IP Addresses through a DHCP server   (4 Marks)

QUESTION TWO (20 Marks)

a) Describe the FOUR(4) phases of structured cabling   (8 marks)

b) Identify the cable that you would choose to move backbone traffic and Give two reasons why?   (2 marks)

c) As a network design consultant you have been tasked by MRUC to design a network that represents how offices in their various buildings would be networked, detailing the type of cables, and networking devices to be used at various points. With aid of a diagram show how this would be represented. (7 marks)

d) Describe the following specialized network devices (3 marks)
    i. VPN Concentrators
    ii. Firewalls
    iii. DNS Servers

QUESTION THREE (20 Marks)

a) Ethernet has survived as the major LAN technology (it is currently used for approximately 85 percent of the world's LAN-connected PCs and workstations).State four reasons why its popular compared to other LAN technologies (4 marks)

b) Describe At least four (4) policies that ensure sound network management. (8 marks)

c) State six ideal operating conditions for a wiring closet (wiring closet specifications) (6 marks)

d) Briefly explain the term baseline measurements in networks (2 marks)

QUESTION FOUR (20 Marks)

a) Briefly explain the term converged network giving at least one of its advantage (2 marks)

b) With aid of a diagram differentiate between flat network design and hierarchical network design. State one advantage and disadvantage of each network design (6 marks)

c) Give three differences between IPv4 and IPv6 (6 marks)

d) MRUC Network administrator has been assigned a network address of 10.15.0.0/8.The institution needs at least seven (7) subnets. What subnet mask will you use (6 Marks)///