

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY

**OF**

**AGRICULTURE AND TECHNOLOGY**

# University Examinations 2015/2016

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**BIT 2116 : NETWORK DESIGN MANAGEMENT**

**DATE: DECEMBER 2015 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER**

**TWO QUESTIONS.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION ONE (30 MARKS)**

(a) Explain the meaning of the following in relation to networking:

1. MAC address. [2 marks]
2. Sub-netting. [2 marks]
3. Subnet mask. [2 marks]
4. Network ID [2 marks]
5. Broadcast ID [2 marks]

(b) A network’s topology affects its capabilities. Describe the hierarchical model and give four advantages of implementing it. [4 marks]

(c) JKUAT Nakuru Campus has purchased the following IP address: 195.5.20.0. It requires 50 hosts per network. Assume a default subnet mask.

1. Determine the number of usable hosts in the network. [5 marks]
2. Determine the number of subnets. [1 mark]
3. Determine the range for the first three subnets. [3 marks]

**{Note: show your workings, clearly outlining the steps you used}.**

(d) JKUAT Nakuru Campus has purchased the following IP address: 195.5.20.0. It has five departments which need a network of their own.

1. Determine the range for each subnet. [5 marks]
2. Show the network ID for each subnet. [1 mark]
3. Show the broadcast ID for each subnet. [1 marks]

**{Note: show your workings, clearly outlining the steps you used}.**

**QUESTION TWO (20 MARKS)**

(a) Network management process consists of five fundamental areas according to International Standards Organizations (ISO). Discuss each. [10 marks]

(b) In a given network, many devices share the same piece of network media. Devices vie for time on the cable through a process called media access. Discuss the two common media access methods. [10 marks]

**QUESTION THREE (20 MARKS)**

(a) In Question 3(b) below, deduce the network class justifying your answer. [2 marks]

(b) You have an IP of 156.233.42.56 with a subnet mask of 7 bit, determine the possible number of hosts and subnets. Show your working. [6 marks]

(c) Network requirements translate into four primary network design goals. Explain each. [6 marks]

(d) Explain any four reasons that may lead to sub netting or segmenting of a network.

[6 marks]

**QUESTION FOUR (20 MARKS)**

(a) Explain the meaning of network security and hence describe the principle network security defenses. [10 marks]

(b) Describe any five goals that you need to establish before undertaking a networking design. [10 marks]

**QUESTION FIVE (20 MARKS)**

(a) When designing the network security system, fundamental IT systems security principles should be taken into account. Explain the following: Layered protections defense in multiple places and defense through diversification. [9 marks]

(b) Explain fault management in the context of networking, and hence describe the steps involved in it. [5 marks]

(c) Explain network management and highlight typical activities involved. [4 marks]

(d) Explain the meaning of classified addressing in the context of IP addressing.

[2 marks]