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

## JOMO KENYATTA UNIVERSITY

**OF**

**AGRICULTURE AND TECHNOLOGY**

# University Examinations 2015/2016

**YEAR TWO SEMESTER TWO EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**BIT 2116: NETWORK DESIGN AND MANAGEMENT**

**DATE: AUGUST 2016 TIME: 2 HOURS**

**QUESTION ONE**

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

i) MAC address (1 mark)

ii) Network ID (1 mark)

iii) Broadcast ID (1 mark)

b) Use the given the IP address to answer the question that follow; IP address 196.100.10.33 (4 marks)

i) Identify the address class

ii) Identify the network portion

iii) Identify the Host portion

iv) Identify the default subnet mask

c) A networks topology affects its capabilities; describe the hierarchical model and give three advantages of implementing it (3 marks)

d) Explain network management and highlight the typical activities involved (4 marks)

e) JKUAT Nakuru campus has purchased the following IP address 197.5.20.0. It requires 50 hosts per network. (Note: show your working, clearly outlining the steps you used)

i) Determine the number of usable hosts in the network (5 marks)

ii) Determine the number of subnet (1 mark)

iii) Determine the range of the first three subnets (3 marks)

f) JKUAT Nakuru campus has purchased the following IP address 197.5.20.0. It has five departments which needs a network of their own (Note: Show your working, clearly outlining the steps you used)

i) Determine the range for each subnet (5 marks)

ii) Show the network ID for each subnet (1 mark)

iii) Show the broadcast ID for each subnet (1 mark)

**QUESTION TWO**

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 network design (10 marks)

**QUESTION THREE**

a) Network management process consists of five fundamental are: according to international standards organizations (150) 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 FOUR**

a) Given the IP 156.233.42.56 with a subnet mask of 7 bits

i) Deduce the network class justifying your answer (2 marks0

ii) Determine the possible number of usable hosts and usable subnets. Show your working (6 marks)

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

c) Explain any four reasons that may lead to sub-netting or segmenting of a network (6 marks)

**QUESTION FIVE**

a) Explain fault management in the context of networking and hence describe the steps involved in it. (5 marks)

b) Given the following IP196.168.1.127 with a custom subnet mask 255.255.255.224. Determine whether the IP is valid. Show your working (6 marks)

c) When designing the network security system, fundamental IT systems security principles should be taken into account. Explain the following; layered protections, defense in multiple place and defense through diversification (9 marks)