



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

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AUGUST – DECEMBER 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE

REGULAR PROGRAMME

CMT 107: COMPUTER NETWORKS

Date: DECEMBER 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

- Q1. a) Give the specific protocols that use the TCP services. **(4 Marks)**
- b) Discuss the differences between peer-peer and server based networks giving advantage of each model over the other. **(6 Marks)**
- c) Briefly explain the major characteristics of the following network architectures. **(6 Marks)**
- a) Ethernet-
 - b) Token Ring
- d) Explain the function of the following internetworking devices. **(6 marks)**
- a) Router
 - b) Gateway
 - c) Brouter
- e) Discuss any two causes of transmission impairments during communication within networks. **(2 Marks)**
- f) Describe any two topologies encountered in computer networks. **(2 marks)**
- g) Explain how collisions on the media is managed using any two media access methods. **(4 Marks)**

- Q2. a) Differentiate between the following terms. **(4 Marks)**
i) Message switching and circuit switching.
ii) Datagram approach versus virtual circuit approach.
- b) A network Engineer was tasked to design a network which has 10 users or hosts. He has a server which is connected to a switch running 10MBps on half duplex mode. How much bandwidth would each host have to the server. **(2 Marks)**
- c) Discuss the seven layers of the open system interconnectivity (OSI) model detailing their functions and characteristics. **(14 Marks)**
- Q3. a) Describe any two types of bounded transmission media and for each mention the bandwidth and the distance it can carry data without the use of a repeater. **(6 Marks)**
- b) Discuss any three network security techniques that can be applied to protect a network from threats. **(6 Marks)**
- c) Describe the fiber optic cable and give reasons for preference of it over the copper wire. **(6 Marks)**
- d) Outline the role of the network interface card during data transmission over the network. **(2 Marks)**
- Q4. a) With the aid of a relevant diagram, illustrate the format of an Ethernet data packet. **(6 Marks)**
- b) Differentiate between polling and contention as access control mechanisms to a network media. **(4 Marks)**
- c) With the aid of relevant diagrams, highlight the differences between peer to peer network and client server network, citing at least two advantages and disadvantages of each. **(10 Marks)**
- Q5. a) Today, networks have expanded beyond the LAN to stretch across the country and around the world into wide area networks. Explain four limitations that hinder the fast growth of networks in a region. **(8 Marks)**
- b) The distinction between peer to peer and server based networks is important because each has different capabilities. What are the factors that you would

consider before making a choice as to which network type you will implement in your organization? **(6 Marks)**

- c) What are the advantages of wireless networks? Discuss any THREE. **(6 Marks)**

END