



*(Knowledge for Development)*

## **KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2020/2021 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS  
YEAR THREE SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF  
BACHELOR OF SCIENCE COMPUTER SCIENCE**

**COURSE CODE : CSC 313.**

**COURSE TITLE : COMPUTER NETWORKS**

**DATE: 22/07/2021**

**TIME: 9:00 A.M – 11:00 A.M**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO**

### QUESTION ONE [COMPULSORY] [30 MARKS]

- a) Differentiate between De jure and Defacto standards? [2 marks]
- b) A non-governmental organization by the name **COVID19-Africa** has opened up an office in Nairobi-Kenya. It intends to set up three regional operational sites in Nyanza, Eastern and Rift valley for effective administration and service delivery to its staff and clients. The organization has future plans of extending its services to Tanzania, Malawi and Zimbabwe. You have been appointed as chief information Officer (**CIO**) to take charge of the organization information systems and infrastructure development for effective and efficient service delivery.
- i. As a CIO, you are tasked with planning for network infrastructure in line with organization's objective. Explain how you would convince the top management of the need to fund development of network at the head office. [12 marks]
- ii. If the management buys the idea in (i) above, explain in detail the type of network you would set up and any two-network equipment you would use. [4 marks]
- iii. In two years, the organization plans to roll out its services to the named countries. Describe the type of network you would plan for, mentioning any at least one technology and equipment you would use for connectivity. [4 marks]
- iv. A consultant hired by the organization has suggested implementation of star topology at the head office in Nairobi. Explain two advantages and one disadvantage of this topology. [4 marks]
- v) Explain the types of error correction mechanisms. [4 marks]

### QUESTION TWO [20 MARKS]

- a) i. IP addresses are split up into several different categories. Outline any three such categories. [3 marks]
- ii. Explain the concept of subnetting as used in computer networking environment. [4 marks]

- b) **i.** Distinguish between classful and classless addressing in networking. **[4 marks]**
- ii.** Addressing in TCP/IP is specified by the Internet Protocol (IP). Explain the structure of IP address. **[2 marks]**
- b) Differentiate between the following types of networks, stating the technology used in each.
- i.** Wired network **[2 marks]**
- ii.** Wireless network **[2 marks]**
- c) Network Operating Systems extend the facilities and services provided by computer operating systems to support a set of computers, connected by a network. The environment managed by a network operating system consists of an interconnected group of machines that are loosely connected. Explain any three services provided by a network operating system. **[3 marks]**

### **QUESTION THREE [20 MARKS]**

- a) Data Link Layer works between two hosts which are directly connected in some sense. Explain the functions of the data link layer in computer networks. **[12 marks]**
- b) In data transmission, the data link layer uses error control mechanisms to ensure that data bit streams are transmitted with certain level of accuracy. Using diagrams illustrate the different types of errors that occur to data in transit. **[8 marks]**

#### QUESTION FOUR [20 MARKS]

- a) What do you understand by “Ethernet is a baseband system”. [2 marks]
- b) Computers can make a wireless connection if they have a wireless network interface card (NIC). Wireless router/s provide a connection with the physical network. Explain the demerits of wireless network to an organization. [4 marks]
- b) Differentiate peer to peer network model and client server network model giving one advantage of each model. [10 marks]
- c) Explain two factors that may influence the final cost of implementing a specific type of media in a critical in network project. [4 marks]

#### QUESTION FIVE [20 MARKS]

- a) Errors in a received frame may be detected by means of a “parity check”. Explain the parity checks that can be performed on the data frame below. [5 marks]

1	0	0	1	0	0	1
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- b) A client is faced with the problem of choosing between the type of twisted pair cables for use in a network project. Outline the pros and cons of the cables and suggest one for the client with reasons. [11 marks]
- c) Describe the methods of inserting UTP cable in RJ 45 plugs. [4 marks]