PIONEER INTERNATIONAL UNIVERSITY

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UNIVERSITY EXAMINATIONS

ACADEMIC YEAR: 2020/2021 **UNIT** : TELECOMMUNICATION SERVICE ARCHITECTURE

SEMESTER: MAY-AUGUST 2021 **UNIT CODE**: BSNA 4130

DATE: AUGUST 2021 **TIME**: 2 HOURS

INSTRUCTIONS: Answer question one (30 marks) and any other two

SECTION A (30 Marks) - Compulsory

Question One

a) State any three *Telecommunication Network Architecture* network **[6 Marks]**

b) Using diagram state the use of Public Switching Telephone Network **[4 Marks]**

c) Explain three safety measures that should be considered when implementing a Broadband Access Connection in an organization **[3 Marks]**

d) Explain the features of **3G** AND **4G** technologies **[2 Marks]**

e) Differentiate between **standards** and **protocol** as used in communication. **[2 Marks]**

f) The management of Ken-forensic Company located in Nairobi Westlands has decided to set up a Virtual Private Network (VPN), type of private network that uses public telecommunication, such as the Internet, instead of leased lines to communicate due more employees working in remote locations

(i) Briefly explain how it works **[4 Marks]**

(ii) Explain the four critical functions of VPNs to Ken-forensics **[4 Marks]**

g) Compare peer- to- peer with a client server architecture giving two advantage of each **[4 Marks]**

i) Explain **Four** reasons why a GSM network will be better than PSTN Network. **[4 Marks]**

h) Distinguish between the following in Telecommunication Networks:

i. PBX and CDMA Technologies. [**2 Marks]**

ii. X.25 and Frame Relay **[2 Marks]**

SECTION B (40 Marks): ANSWER ANY TWO QUESTIONS

Question Two

a) Explain *OSI Model* Network As applied in Telecommunication framework. **[2 Marks]**

b) The board of directors for Polytech Ltd has resolved to network all the buildings within the company. Justify their decision. **[2 Marks]**

c) Identify two types of error that could occur during data transmission, stating their causes. **[2 Marks]**

d) UNICOM CO.LTD is one year old company that is owned by four computer science SEKU graduates. Their business has picked up very fast and they have decided to set up a computer network to link 5 offices. They have listed the following networking components/software as a requirements; 5 NIC cards, a 12 port switch, 100m copper cables, 5 RJ45 pins, 1 repeaters, 1 server , 5 personal computers, 1 router , 1 printers and network operating system.

Required:

i) Explain **Four** reasons why a network will be better than a standalone computer. **[4 Marks]**

ii) Explain **Four** limitations of using a network in their organization **[4 Marks]**

iii) Design the most appropriate LAN layout for the company. Label the devices appropriately. **[6 Marks]**

Question Three

a) A magazine publisher based in Nairobi has a branch in Kisumu, and one in Mombasa. The company has kept in touch by telephone and courier service. Each office is networked. The networks were implemented five years ago and each has a 10 Base 5 Ethernet network. Lately, the company has been developing projects that involve teams consisting of members from more than one office. Each office has resources that others do not; the current projects require all of these resources. The networks have frequent cable problems, and each time they have one, the entire network goes down until the problem is resolved.

The management team would like a networking solution which would offer easier troubleshooting, less downtime, and WAN communications between sites. They would like the WAN connections to support 256 Kbps of data and several telephone conversations. The combination of long distance calls and courier service should be eliminated by the WAN.

Management would like the WAN to be able to continue operation even if one of the WAN links fails.

i) Identify at least two items at every site that needs upgrading. **[2 Marks]**

ii) Explain the type of WAN connection (link)that will be used to connect the three sites to each other. **[2 Marks]**

iii) State the number of WAN connections that will be used to connect the three sites. Show the links in a diagram. **[2 Marks]**

iv) Mention the type of device that will be used to connect the multiple signals from both voice and data and put them on the same WAN link. **[2 Marks]**

v) State the type of connectivity device that should be used to connect the LAN to the multiple paths in the WAN created. **[2 Marks]**

vi) Explain the circumstances that would you recommend the use of X.25, Frame Relay and ATM networks. **[3 Marks]**

c) Explain the layered communication between two computers based on the OSI model.**[7 Marks]**

Question Four

a) Outline the aims of each of the following institutions

(i) ISO

(ii) IEEE **[2 Marks]**

b) Describe the following types of communication networks

i. Circuit switched

ii. Packets switched **[4 Marks]**

c) With aid of a block diagram, illustrate the application of OSI architecture to connect two ends systems **[7 Marks]**

d) Outline any three reasons for connecting a bridge in a LAN. **[3 Marks]**

e) Explain two factors to consider in choosing a transmission media. **[4 Marks]**