COSC 261

CHUKA   UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF BACHELOR SCIENCE IN COMPUTER SCIENCE

COSC 261: FUNDAMENTALS OF COMPUTER NETWORKS

STREAMS: BSC. COMP. SCI (Y2S1)   **TIME: 2 HOURS**

DAY/DATE: THURSDAY 25/03/2021   **11.30 A.M. – 1.30 P.M**

INSTRUCTIONS:
- Answer Question **ONE** and any other **TWO** questions.
- Sketch maps and diagrams may be used whenever they help to illustrate your answer
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **No** use of mobile phones or any other unauthorized materials

QUESTION ONE: COMPULSORY

ANSWER ALL QUESTIONS IN THIS SECTION

a) What is the fundamental characteristics that determines the effectiveness of any data communication system?   [4 marks]

b) Differentiate intranet from extranet, give examples?   [2 marks]

c) Outline the role of a modems in data communication

[4 marks]

d) Discuss fiber optic communication media and why they are preferable to other types   [4 marks]

e) With the use of sketches to illustrate your answer, discuss analog and digital signals   [2 marks]

f) With use of sketches to illustrate your answer, explain why a pair of modems is always used to transmit digital signals over a long telephony network.   [4 marks]

g) With the use of Sketches to illustrate your answer, Discuss the major components that constitute Computer network.   [10 marks]

SECTION B: CHOOSE ANY TWO QUESTIONS FROM THIS SECTION

Question 2 (20 Marks)

a) You are sending an email message to a business associate based in the city of Hull, United Kingdom. You are based in Chuka University Kenya. Use the OSI model to explain the steps the email communication will go through.

[10 marks]

b) Data is a collection of raw facts which are processed to deduce meaningful information. Discuss the various forms that can be used to represent the data used in computer networks   [10 marks]

Question 3 (20 Marks)

a) Discuss how businesses can benefit from the use of the internet   [5 marks]

b) By use of a diagram identify and discuss the structure of a data packet and the roles of each segment as presented in a packet switched network

[10 marks]

c) One of the newest uses for the Internet Protocol (IP) is that of VoIP. Discuss this concept   [5 marks]

Question 4 (20 Marks)

a) Identify and discuss some of the challenges being faced in the use of wireless technologies in organizations. What solutions can you offer?

[4 marks]

b) Identify and discuss the three phases of data communication in a circuit switched network   [6 marks]

c) By use of a diagram discuss the ring topology. How is collision control and avoidance is achieved in a ring topology network   [10 marks]

Question 5 (20 Marks)

a. Two devices communicate with each other by sending and receiving data. Discuss the various ways in which the data can flow between two communication devices and give an example in each.   [12 marks]
Sketches of data communication model, steps in data transmission

b. What is a computer network? Discuss any four issues that any given computer network should address.   [8 marks]