

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN  
COMPUTER SCIENCE**

**COSC 260: DATA COMMUNICATION**

**STREAMS: BSC COMPUTER SCIENCE Y2S2**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 12/07/2021**

**11.30 A.M. – 1.30 P.M.**

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**INSTRUCTIONS:**

- Attempt question ONE (Section A) and any other TWO from SECTION B
- Marks are awarded for clear and concise answers
- ONLY the first THREE Questions attempted will be marked (Question one inclusive)

**SECTION A-Compulsory**

**QUESTION ONE (30 MARKS)**

- a) Define the following terms
- (i) Data communication (2 Marks)
  - (ii) Multiplexing (2 Marks)
  - (iii) Internet protocols (2 Marks)
- b) With the help of a diagram explain the components of data communication. (6 Marks)
- c) Explain three types of communication modes with the help of diagram (6 Marks)
- d) Explain three types of signal modulations with the help of a diagram. (6 Marks)
- e) Explain three considerations when choosing a communication media (6 Marks)

**Question Two (20 marks)**

- a. Differentiate between
- (i) Server based architecture and peer based architecture (6 Marks)
  - (ii) Ethernet technology and token passing technology (6 Marks)

- b. You are requested to design a university local area network. Discuss physical and logical design and present it in a diagram assuming it is a star topology (8 Marks)

**Question Three (20 marks)**

- a. Cisco has defined a hierarchical model known as the hierarchical internetworking model.
- (i) Explain three functional areas of the network. (6 Marks)
  - (ii) Explain the advantages of the model (4 Marks)
- b. A noise signal consists of a mixture of frequencies with random amplitudes.
- (i) Explain four sources of noise in a data network (4 Marks)
  - (ii) In a communication system which uses 101 CRC for error detection, a sender wants to send 11001 data stream. Explain the process from the sender to the receiver (6 Marks)

**Question FOUR (20 marks)**

- a. Explain three functions of
- (i) Data link layer (3 Marks)
  - (ii) Networking layer (3 Marks)
- b. Explain three differences between UDP and TCP in transport layer (6 Marks)
- c. The university is hiring a network administrator to be in charge of the university network. Explain the skills and duties of a good administrator (8 Marks)

**Question FIVE (20 marks)**

- a. Explain three objectives of network security (6 marks)
- b. Explain attacks that targets computer networks and how they can be protected (6 marks)
- c. Explain the following emerging technologies in data communication
- (i) mobile computing (4 marks)
  - (ii) Tele medicine (4 marks)
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