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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2020/2021 ACADEMIC YEAR TWO**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF PURE AND APPLIED SCIENCES**

**FOR THE DEGREE OF BACHELOR OF INFORMATION SCIENCE**

**COURSE CODE: INS 210**

**COURSE TITLE: DATA COMMUNICATION**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 17/08/2021 TIME: 09.00-11.00 AM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of TWO (2) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Define the following terms
   1. Data communication [2 Marks]
   2. modulation [2 Marks]
   3. Internet protocols **[2 Marks]**
2. Explain the advantages of computer networks in an organization (6 Marks)
3. Explain three types of communication modes with the help of diagram **[6 Marks]**
4. Explain three advantages of optical fiber compared to other communication media (6 Marks)
5. Explain three considerations when choosing a communication media (6 Marks)

**QUESTION TWO**

1. Differentiate between
   1. Server based architecture and peer based architecture (6 Marks)
   2. Ethernet technology and token passing technology (6 Marks)
2. 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**

1. Explain three types of signal Multiplexing techniques in a data communication system (6 Marks)
2. With the help of a diagram explain the components of digital communication circuit (6 Marks)
3. 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 (8 Marks)

**QUESTION FOUR**

1. Explain the functions of
   1. Data link layer (3 Marks)
   2. Networking layer (3 Marks)
2. Explain three differences between UDP and TCP in transport layer (6 Marks)
3. 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**

1. Explain three objectives of network security (6 marks)
2. Explain attacks that targets computer networks and how they can be protected (6 Marks)
3. Explain the following emerging technologies in data communication
   1. mobile computing (4 marks)
   2. Tele medicine (4 marks)