



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF INFORMATION AND INNOVATIVE SYSTEM**  
**BACHOLER IN SCIENCE (BIOLOGICAL SCIENCES)**  
**SEPTEMBER /DECEMBER 2024**  
**YEAR 2 SEMESTER 1**  
**MAIN CAMPUS**

**COURSE CODE: ITB 9201**

**COURSE TITLE: DATA COMMUNICATION AND NETWORKING**

**EXAM VENUE: MAIN STREAM**

**TIME: 2HOURS**

**INSTRUCTIONS**

1. *Answer question ONE (compulsory) and any other Two questions.*
2. *Candidates are advised not to write on the question paper*
3. *Candidates must hand in their answer booklet to the invigilator while in the examination room*
4. *No mobile devices (e.g. laptops, phones. etc.) are allowed into the Examination Room*
5. *This paper consists of two printed pages*

**QUESTION ONE (30 MARKS)**

- a) i) Define data communication (2marks)  
ii) State **four** components of data communication systems (4marks)
- b) Explain **two** ways in which data representation is done in a computer (4marks)
- c) Write the following acronyms in full (4marks)
  - i. TCP
  - ii. HTTP
  - iii. IP
  - iv. LAN
- d) i) Define the term Bluetooth technology in data communication (2marks)  
ii) Explain **two** types of Bluetooth networks (4marks)
- e) Define forward error correction (2marks)
- f) Explain the following terms as used in data flow.
  - i. Simple duplex (2marks)
  - ii. Half duplex (2marks)
  - iii. Full duplex (2marks)
- g) Define networking (2mark)

**QUESTION TWO (20 MARKS)**

- a. Differentiate between intranet and internet (2marks)
- b. Explain security as used in network (2marks)
- c. i) Define **OSI** layer (2marks)

ii) Explain the OSI layer models using a well labelled diagram (14marks)

**QUESTION THREE (20 MARKS)**

- a) i) Define topology as used in networking (2marks)
- ii) State **two** types of topologies (2marks)
- b) Explain **four** types of physical topologies used in roman (i) above (8marks)
- c) Give four differences between **Local Area Network (LAN)** and **Wide Area Network (WAN)** (4marks)
- d) What are the characteristics which makes LANs differ from other networks(3marks)
- e) What is MAN (1marks)

**QUESTION FOUR (20 MARKS)**

- a) State three types of transmission medium used in data communication (3marks)
- b) i) Define Data Terminal Equipment (2marks)
- ii) Give **two** Data Terminal Equipment (2marks)
- c) i) State **three** formats of data encoding (3marks)
- ii) Explain **two** importance of error coding (4marks)
- d) i) Define attenuation (2marks)
- e) Differentiate between analog data and digital signal (4marks)

**QUESTION FIVE (20 MARKS)**

- a) i) Define **MODEM** (4marks)
- ii) Explain different types of **MODEM** (4marks)
- b) Explain Shield Twisted Pair (**STP**) and Unshielded Twisted Pair (**UTP**) (4marks)
- c) Explain the Point-to-Point Protocol in details (5marks)
- d) What do you mean by ATM? (3marks)