

**NED UNIVERSITY OF ENGINEERING & TECHNOLOGY**  
**FIRST YEAR(Bachelor of Science in Computer Science & Information Technology)**  
**FALL SEMESTER EXAMINATIONS 2023**  
**Batch 2023**

Time : 3 Hours

Dated : 22-JAN-24

Max Marks : 60

Fundamentals of Information Technology - CT-174

- Read the questions carefully.
- Attempt all questions.
- All questions carry equal marks.
- Calculator not allowed.

**Q1. Explain the importance of data structures by providing real-life examples. Also, explain the data structures named as stack, queue, and linked list. Describe any scenario where a linked list is preferred over array.**

[CLO-1: 10 Marks]

**Q2. Explain all the classes of IP addresses (IPv4). What is the need for these classes of IP addresses? Why is IPv6 necessary when IPv4 is already available? Explain the network topologies (any three) with the help of diagrams.**

[CLO-1: 10 Marks]

**Q3. Explain the Information System, its components, and types in detail. In addition, explain the Management Information System (MIS), why it is necessary, and outline the benefits of the Management Information System.**

[CLO-1: 10 Marks]

**Q4. Translate the following (show all steps):**

- I.  $(10110011)_2 = (?)_8$  263
- II.  $(1752)_8 = (?)_{16}$  3EA
- III.  $(1011011010)_2 = (?)_{16}$  2DA
- IV.  $(102CA)_{16} = (?)_8$  203 2013 12
- V.  $(7031)_8 = (?)_2$

[CLO-2: 10 Marks]

**Q5. Differentiate** between simplex, half-duplex, and full duplex communication. **Identify** the mode of communication (simplex, half-duplex, or full duplex) and the type of media (guided or unguided) according to the given scenarios:

No.	Scenarios	Mode of Communication	Type of Media
1	A public announcement system at a train station delivering pre-recorded information about upcoming departures.		
2	A group of hikers using walkie-talkies to communicate during a hiking trip.		
3	An online multiplayer gaming session where players can communicate with each other in real time.		
4	A weather station broadcasting continuous weather updates over a radio frequency.		
5	A guest speaker using a microphone to address a large auditorium during a seminar in university.		
6	A live television interview where the host and guest engage in a back-and-forth conversation.		
7	A security guard monitoring a surveillance camera and speaking into a microphone to issue warnings.		
8	Two individuals talking on smartphones using a video call application.		
9	Text messages exchanged between two individuals using mobile phones.		
10	Emergency services coordinating their response to a natural disaster using a radio communication system.		

[CLO-2: 10 Marks]

**Q6. Discuss** the advantages of the database approach over the file-based approach, using a diagram. Also, explain the concept of CRUD operations with appropriate SQL commands.

[CLO-2: 10 Marks]