



**UNIVERSITY EXAMINATIONS**  
**EXAMINATION FOR JANUARY/APRIL 2023/2024 DIPLOMA IN COMPUTER**  
**SCIENCE/INFORMATION TECHNOLOGY/BUSINESS INFORMATION**  
**TECHNOLOGY**  
**COURSE CODE:RCT 007,RCS 029,RCS 038,RIT 022 COURSE UNIT:DATA**  
**COMMUNICATION&NETWORKS,IT SUPPORT &NETWORKING,DATA**  
**COMMUNICATION &ESSENTIALS**

**DATE: 18<sup>th</sup> APRIL2024**

**TIME: 2 HOURS**

**GENERAL INSTRUCTIONS:**

Students are NOT permitted to write on the examination paper during exam time.

This is a closed book examination. Text book/Reference books/notes are not permitted.

**SPECIAL INSTRUCTIONS:**

This examination paper consists Questions in Section A followed by section B.

Answer Question 1 and any Other Two questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **Keep ALL bags and caps at the front of the examination room and DO NOT refer to ANY unauthorized material before or during the course of the examination.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. ( ) will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

### QUESTION ONE (30 Marks-COMPULSORY)

- (a) Discuss the following motivations for computer networks:
- i. High Reliability (2 marks)
  - ii. Mix and Match (2 marks)
- (b) Define the following terminologies as used in computer networks:
- i. Metropolitan Area Network (MAN) (1 mark)
  - ii. Virtual Private Network (VPN) (1 mark)
  - iii. Throughput (1 mark)
  - iv. Packet (1 mark)
- (c) Briefly discuss the **three (3)** fundamental characteristics of a data communication system. (6 marks)
- (d) Outline the **five (5)** components of a data communication system. (5 marks)
- (e) Explain any six different ways in which computer networks differ from each other. (6 marks)
- (f) Discuss briefly five factors that must be taken into account when deciding what type of Network Operating System to install on a network. (5 marks)

### QUESTION TWO

- (a) Explain any six benefits of the OSI Model (6 marks)
- (b) Describe the half-duplex (CSMA/CD) access method. (4 marks)
- (c) State four means that wireless networks use to carry signals from one computer to another without permanent cable connection (4 marks)
- (d) Outline **five (5)** components of a data communication system (5 marks)
- (e) List **two** major characteristics of LAN network (1 mark)

### QUESTION THREE

- (a) Explain briefly the functions of WAN network (4 marks)
- (b) Define the following terms as used in Computer networks:
- i. Attenuation (1 mark)
  - ii. Noise (1 mark)
  - iii. Distortion (1 mark)
  - iv. Topology (1 mark)
- (c) State any two advantages of wireless networks. (2 marks)
- (d) Explain briefly the concept of intranets and extranets (4 marks)
- (e) Differentiate between
- i. Logical and Physical network topologies (2 marks)
  - ii. Cut-through switching and store-and-forward switching (2 marks)
  - iii. Broadband and Baseband signaling (2 marks)

### QUESTION FOUR

- (a) State **any six** rules that should be followed in order to avoid injury when working with fiber-optics. (6 marks)
- (b) List **any four** of the considerations a network administrator needs to take into account when deciding on what type of WAN connection to use in the network design. (4 marks)
- (c) Describe **four** guidelines for creating effective network documentation (4 marks)
- (d) Explain briefly the concept of Storage Area Networks (SANs). (2 marks)
- (e) Discuss the following concepts as used in computer networks:
- i. Fault Tolerance (2 marks)
  - ii. Scalability (2 marks)

### QUESTION FIVE

- (a) Courses delivered using network or Internet resources are often called online learning experiences, or e-learning. The availability of e-learning courseware has multiplied the resources available to students many times over. Discuss the benefits of the e-learning courseware. (6 marks)

(b) Briefly:

- i. Describe a peer-to-peer network. **(2 marks)**
- ii. Explain the benefits of peer-to-peer network **(2 marks)**
- iii. Explain **two** benefits of a client/server network. **(2 marks)**

(c) A network topology is a physical layout of the network. Discuss the following topologies, using appropriate diagrams: **star, bus and ring.** **(6 marks)**

(d) List **two** reasons why bandwidth is important in computer networks **(2 marks)**