



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91 CADASTRAL ZONE, NNAMDI AZIKWE EXPRESSWAY, JABI, ABUJA**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**2023\_2 EXAMINATIONS**

---

**COURSE CODE: CIT852**

**COURSE TITLE: DATA COMMUNICATION AND COMPUTER NETWORKS**

**CREDIT: 3 UNITS**

**TIME ALLOWED: 2½ HOURS**

**INSTRUCTIONS: ANSWER QUESTION 1 AND ANY OTHER FOUR (4) QUESTIONS**

Q1.

- (a) Outline four (4) basic goals that a typical computer network should satisfy. (4 marks)
- (b) Distinguish between broadcast and point-to-point or switched networks. (4 marks)
- (c) Define network topology and list four typical network topologies? (6 marks)
- (d) Describe the four (4) layer of the TCP/IP Protocol Suite. (8 marks)

Q2.

- (a) Explain the difference between Client/Server and Peer-to-peer architecture? (4 marks)
- (b) Define the following terms
  - I. TCP/IP (2 marks)
  - II. UDP (2 marks)
  - III. The Internet Group Management Protocol (IGMP) (2 marks)
  - IV. Metropolitan Area Network (MAN) (2 marks)

Q3.

- (a) Compare and contrast between Frequency Division Multiplexing vs Time Division Multiplexing (4 marks)
- (b) Explain how Fibre Optics is used to transmit data? (2 marks)
- (c) Mention two (2) ways by which optical fiber connector/splice loss can occur? (2 marks)
- (d) Differentiate between Circuit Switched Network and Packet Switched Networks (4 marks)

Q4.

- (a) Describe the operation of the Slow Start Algorithm? (2 marks)
- (b) Compare Parallel and Serial transmission methods of transmitting data and mention the situation where Parallel transmission is a better choice as compared to serial transmission. (6 marks)

(c) When data is transmitted from a transmitter to receiver, there can be transmission errors. List three (3) major causes of transmission problems.

(3 marks)

(d) What is the full meaning of CIDR (1 mark)

Q5.

(a) Define modulation and mention its types. (5 marks)

(b) Distinguish between Simplex, Half Duplex and Full Duplex Communication (6 marks)

(c) Write out the full meaning of the routing protocol OSPF (1 mark)

Q6.

(a) In the table below, identify the layers of the OSI model to which the data packages belong. (6 marks)

Data Package Name	Layer
Application Protocol Data Unit	Application Layer
Bit	(i)
Frame	(ii)
Datagram, packet	(iii)
Session Protocol Data Unit	(iv)
Protocol Data Unit (PDU)	(v)
Segment	(vi)

(b) Briefly discuss two (2) factors that have led to the rapid growth of Internet in recent times. (2 marks)

(c) What is the main difference between the analogue and digital modes of data transmission? (2 marks)

(d) Explain briefly why connection-oriented services known as reliable services. (2 marks)