



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA**  
**FACULTY OF SCIENCE**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**2020\_2 EXAMINATION**

**COURSE CODE CIT 852**

**TITLE: DATA COMMUNICATION AND NETWORK**

**CREDIT UNIT: 3 UNITS**

**Time Allowed: 2 ½ Hours**

**Instruction: Answer Question 1 and Any Four other Questions.**

**QUESTION 1**

- (a) Describe the four components of Data Communication. (2 marks)
- (b) To compare and contrast between Human Communication and Data Communication:
  - (i) State four sources of human communication (4 marks)
  - (ii) State the equivalent sources of computer Data Communication. (4 marks)
- (c) Distinguish between Time Division and Frequency Division multiplexing (4 marks)
- (d) Describe Digital Transmission? (2 marks)
- (e) Differentiate between Broadcast and point-to-point networks (2 marks)
- (f) Explain four (4) difference between Client/Server and Peer-to-peer architecture? (4 marks)

**QUESTION 2**

- (a) With the aid of diagram, describe the following mode of data transmission.
  - (i) Simplex (2 marks)
  - (ii) Half-duplex (2 marks)
  - (iii) Full-duplex (2 marks)
- (b) State four (4) differences between Parallel and Serial transmission methods. (4 Marks)
- (c) Give two reasons for using layered protocols. (2 marks)

**QUESTION 3**

- (a) Explain what happens at any three of the seven OSI layers (3 marks)
- (b) Using a set of machines *A* and *B*, briefly explain four (4) operations of Bridges. (3 marks)
- (c) Explain the TCP/IP reference model. (2 marks)
- (d) State the two important features of the TCP/IP research. (2 marks)
- (e) Describe two (2) difference between OSI and TCP/IP layers. (2 marks)

**QUESTION 4**

- (a) State three (3) services that Transport layer provide for Applications layer. (3 marks)
- (b) A relative has contacted you for help; he believes the Internet is broken. The fault turns out to be that a piece of network-protection software had installed a specific IP address entry for an (alternative) default DNS server.
  - (i) What should have provided the correct DNS entry? (2 Marks)
  - (ii) By concentrating on how DNS is intended to work, describe why network applications may not work correctly. (3 Marks)

- (c) Explain four (4) advantages of Networks. (4 marks)

**QUESTION 5**

- (a<sub>i</sub>) Describe the concept of Network Topology and (2 marks)  
(a<sub>ii</sub>) Give two advantages (2 Marks)  
(b) Explain the following Network Topologies.  
(i) Bus Topology (2 marks)  
(ii) Star Topology (2 marks)  
(iii) Ring Topology (2 marks)  
(c) Differentiate between Tree topology with Star topology (2 marks)

**QUESTION 6**

- (a) Differentiate between Asynchronous and Synchronous Modems (4 Marks)  
(b) Explain the term bandwidth. (2 marks)  
(c) Why is bandwidth useful? (2 marks)  
(d) What is Isochronous Transmission? (2 marks)  
(e) Mention the situation where Parallel transmission stands a better choice to serial transmission. (2 marks)