



**ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO  
STATE**

**FACULTY OF ENGINEERING  
DEPARTMENT OF ELECTRICAL AND  
COMPUTER ENGINEERING**

**FIRST SEMESTER EXAMINATION, 2017/2018 ACADEMIC SESSION**

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

**COURSE CODE: ECE409/ECT415**

**EXAMINATION DATE: 23<sup>RD</sup> MARCH 2018**

**COURSE LECTURER: PROF. A. I. OLUWARANTI**

A handwritten signature in black ink, enclosed in a rectangular box. The signature appears to be 'A. I. Oluwaranti'.

**HOD's SIGNATURE**

**TIME ALLOWED: 3 HOURS**

**INSTRUCTIONS:**

1. ANSWER FIVE QUESTIONS ONLY
2. SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM.
3. YOU ARE NOT ALLOWED TO BORROW ANY WRITING MATERIALS DURING THE EXAMINATION.

### Question #1

- (a) Fully discuss the term Data Communication. [4 marks]
- (b) Highlight the fundamental characteristics of effective Data Communication. [6 marks]
- (c) List and discuss the different form of data representation in Data Communication. [6 marks]
- (d) Discuss the two major categories of transmission media. [4 marks]

### Question #2

- (a) Fully differentiate between BOOTP and DHCP. [6 marks]
- (b) An efficient Computer Networks must be able to meet certain minimum criteria. List and discuss at least three (3) of these criteria. [6 marks]
- (c) Performance is inversely related to delay. Discuss. [4 marks]
- (d) Discuss the significance of twisting in twisted-pair cable. [4 marks]

### Question #3

- (a) Highlight the challenges inherent in IPv6 deployment. [5 marks]
- (b) Enumerate and discuss the ways ISPs coping with IPv4 runout. [5 marks]
- (c) Discuss the differences between connectionless and connection-oriented service. [4 marks]
- (d) Define fragmentation and explain why IPv4 protocol needs to fragment some packets. [6 marks]

### Question #4

- (a) Discuss the difference between classful addressing and classless addressing in IPv4. [6 marks]
- (b) List the classes in classful addressing and define the application of each class. [4 marks]
- (c) Adduce reason(s) why most addresses in class A are wasted. [4 marks]
- (d) Give reason(s) why a medium-size or large-size corporation will not want a block of class C addresses. [6 marks]

### Question #5

Given an IP Address: 205.42.134.78/23. Calculate the following data: [2 marks each]

- (i) Netmask Address, (iii) First Host Address,
- (ii) Broadcast Address, (iv) Netmask Bits,
- (v) Network Address, (vi) IP Address in Bits,
- (vii) Network Address in Hexadecimal,
- (viii) Address Class (ix) Last Host Address,
- (x) Total number of Actual Host in the Network Segment

### Question #6

- (a) Write short notes on the following: [3 marks each]  
(i) ARP (ii) NAT (iii) IP Datagram (iv) LLC (v) UTP
- (b) Fully differentiate between single mode and multimode fibre optic cable. [5 marks]

### Question #7

- (a) "People move, Networks don't.". In the context of wireless technology, discuss the veracity and implication of this statement. [4 marks]
- (b) Fully discuss with illustration the responsibilities of the Data link layer in TCP/IP Architecture. [6 marks]
- (c) Discuss the difference(s) between the delivery of a frame in the data link layer and the delivery of a packet in the network layer. [6 marks]
- (d) Briefly discuss the benefits of Mobile computing. [4 marks]