



“Investing in Africa’s Future”

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE (CBPLG)

NCIS 307: DATA COMMUNICATION & COMPUTER NETWORKS

END OF SECOND SEMESTER EXAMINATIONS

APRIL 2023

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DURATION: 3 HOURS

INSTRUCTIONS

Answer the question as per the instructions given in the sections

Start **each** question on a new page on your answer sheet.

The marks allocated to **each** question are shown at the end of the section.

Section A (20 Marks)

Q.1 Choose the correct or the best alternative in the following: (2×10)

- i. "Parity bits" are used for which of the following purposes?
 - A. Encryption of data
 - B. To transmit faster
 - C. To detect errors
 - D. To correct the error
- ii. What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences?
 - A. Unshielded twisted pair
 - B. Optical fiber
 - C. Coaxial cable
 - D. Microwave
- iii. Which of the following address belongs class A?
 - A. 121.12.12.248
 - B. 130.12.12.248
 - C. 128.12.12.248
 - D. 129.12.12.248
- iv. What IP address class allocates 8 bits for the host identification part?
 - A. Class A
 - B. Class B
 - C. Class C
 - D. Class D
- v. Which layer of the TCP / IP stack corresponds to the OSI model transport layer?
 - A. Host to host
 - B. Application
 - C. Internet
 - D. Network Access
- vi. The correct order of corresponding OSI layers for having functionalities of routing and reconciling machine representation differences with shared access resolution and ASCII test protocol is?
 - A. Network, Physical, Transport, Data link
 - B. Network, Physical, Data link, Application
 - C. Network, Presentation, Data link, Application
 - D. Network, Presentation, Physical, Transport
- vii. MAC address is also called _____.
 - A. Physical address
 - B. Logical address
 - C. Source address
 - D. Destination address
- viii. Which of the following protocols is the connection-less protocol?
 - A. UDP
 - B. TCP
 - C. IP
 - D. All of the these
- ix. How many pins does RJ-45 contain?
 - A. Two
 - B. Four
 - C. Eight
 - D. Ten
- x. What is the maximum length of the STP wire?
 - A. 20 ft
 - B. 50 ft
 - C. 50 meters
 - D. 100 meters

Section B (40 Marks)

Q2. Answer any Five questions from Section B.

(8×5=40)

a. Mention the type of address for the following IP address

- (i) 132.33.144.56
- (ii) 122.53.23.66
- (iii) 195.133.142.26
- (iv) 232.152.125.45

b. Compare LAN, WAN and MAN network.

Or

Consider the following IP Header (Hexadecimal Format) from an IP packet received at destination, in which the checksum is set to 0:

4 5 0 0, 0 0 3 C, 1 C 4 6, 4 0 0 0, 4 0 0 6, 0 0 0 0, A C 1 0, 0 A 6 3, A C 1 0, 0 A 0 C

What is the checksum value calculated at destination.

c. Explain the functions performed by the following layers of OSI model

- (i) Network layer
- (ii) Data link layer

d. Is an oil pipeline a simplex system, a half-duplex system, a full-duplex system, or none of the above? What about a river or a walkie-talkie-style communication?

e. Briefly explain different guided media commonly used for data transmission.

Or

What advantage does twisting provide in twisted pair wires? Differentiate between Category 3 and Category 5 twisted pairs.

f. Given a 10 bit sequence 1010011110 and a divisor of 1011. Find the CRC. Check your answer.

Section C (40 Marks)

Q3. Answer any two questions from Section C.

(20×2=40)

a. Why is it necessary to have layering in a network? How two adjacent layers communicate in a layered approach? With neat block diagram explain the TCP/IP concept.

b. If a 7 bit hamming code word received by the receiver is 1011011. Assuming the even parity state whether the received code word is correct or wrong. If wrong, locate the bit in error.

c. Explain the following:

- i. Star topology

- ii. Bus Topology
- iii. UDP
- iv. Mesh Topology

END OF PAPER