



*(Knowledge for development)*  
**KIBABII UNIVERSITY  
(KIBU)**

**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS  
YEAR TWO SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF SCIENCE  
(INFORMATION TECHNOLOGY)**

**COURSE CODE : BIT 214**

**COURSE TITLE : COMPUTER NETWORKING**

**DATE: 14/12/2022**

**TIME: 9.00 A.M – 11.00 A.M**

---

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

### QUESTION ONE [COMPULSORY - 30 MARKS]

- (a) State the meaning of the following terms applicable in computer networking
- (i) Communication Protocol [1 mark]
  - (ii) Data Communication [1 mark]
  - (iii) Peer to peer process [1 mark]
  - (iv) Default Gateway [1 mark]
- (b) TCP/IP support the Internet Protocol IP (unreliable) which is a host-to-host protocol.
- (i) State four other supporting protocols at the internet layer [4marks]
  - (ii) List four levels of addresses are used in an internet employing the TCP/IP protocols [4marks]
- (c) (i) Briefly discuss three improvements that IPv6 provides to overcome limitations of IPv4 [3marks]
- (ii) Enumerate three features of a default gateway in relation to host routing [3marks]
- (d) State and briefly four key fault management processes required in network management and operations [4marks]
- (e) (i) Illustrate using a diagram and discuss how resource sharing is achieved on a simple peer-to-peer network [5marks]
- (ii) List three disadvantages of peer to peer networks [3marks]

### QUESTION TWO [20 MARKS]

- (a) Define the following applicable terms applicable in wireless computer networking
- (i) Access Point [2 marks]
  - (ii) Bluetooth [2 marks]
- (b) Correctly match the *show ip route* command with its respective route sources in the table below [4 marks]

Command	Route Source
S	Directly connected local interface IP address
L	Directly connected network
O	Static route was manually configured by an administrator
C	Open Shortest Path First

- (c) Illustrate using a diagram and briefly discuss how information traverse through the Internet [5marks]
- (d) List and briefly explain three advantages of client/server networks relative to peer-to-peer networks [3 marks]
- (e) The application layer of the OSI model is responsible for providing services to the user. Enumerate four specific functions of this layer [4 marks]

### QUESTION THREE [20 MARKS]

- (a) State the meaning of the following applicable terms applicable in wireless computer networking
- i. The Internet [2 marks]
  - ii. Cloud computing [2 marks]
- (b) A page on the Internet is translated into digital information, chopped into 1500-byte pieces called **PACKETS**, and sent and reassembled at the receiver. Illustrate using a diagram four part of the packet and their specific functions [6 marks]
- (c) The transport layer is responsible for the delivery of a message from one process to another (process to process delivery). State four specific functions of transport layer [4 marks]
- (d) (i) Mail server is one of the multiple types of communication services provided by data networks for coordination of storage and transfer of emails. List four additional tasks performed by the mail server [4marks]
- (ii) Apart from the main role of Internet of bringing web pages to the end users' device, list the other two services provided by the Internet [2marks]

### QUESTION FOUR [20 MARKS]

- (a) State the meaning of the following terms applicable in cache organization
- (i) Cloud [2 marks]
  - (ii) Virtual Private Network (VPN) [2 marks]
- Answer*
- (b) (i) In peer-to-peer process, the passing of the data and network information down through the layers of the sending device and backup through the layers of the receiving device is made possible by **interface** between each pair of adjacent layers. Briefly explain the role of the interface [2 marks]
- (ii) Network topology defines the structure of the network and can be broadly classified as either as physical, logical or hybrid topology. Briefly state how logical topology is different from physical topology and list two forms of logical topology [4 marks]

- (c) Illustrate using a diagram and briefly discuss how information traverse through the Internet [5marks]
- (d) List and briefly explain three advantages of client/server networks relative to peer-to-peer networks [3 marks]
- (e) The application layer of the OSI model is responsible for providing services to the user. Enumerate four specific functions of this layer [4 marks]

### QUESTION THREE [20 MARKS]

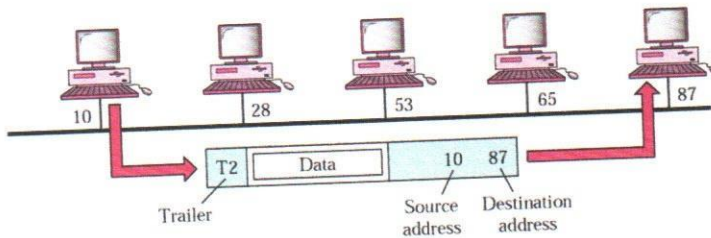
- (a) State the meaning of the following applicable terms applicable in wireless computer networking
- i. The Internet [2 marks]
  - ii. Cloud computing [2 marks]
- (b) A page on the Internet is translated into digital information, chopped into 1500-byte pieces called **PACKETS**, and sent and reassembled at the receiver. Illustrate using a diagram four part of the packet and their specific functions [6 marks]
- (c) The transport layer is responsible for the delivery of a message from one process to another (process to process delivery). State four specific functions of transport layer [4 marks]
- (d) (i) Mail server is one of the multiple types of communication services provided by data networks for coordination of storage and transfer of emails. List four additional tasks performed by the mail server [4marks]
- (ii) Apart from the main role of Internet of bringing web pages to the end users' device, list the other two services provided by the Internet [2marks]

### QUESTION FOUR [20 MARKS]

- (a) State the meaning of the following terms applicable in cache organization
- (i) Cloud [2 marks]
  - (ii) Virtual Private Network (VPN) [2 marks]
- Answer*
- (b) (i) In peer-to-peer process, the passing of the data and network information down through the layers of the sending device and backup through the layers of the receiving device is made possible by **interface** between each pair of adjacent layers. Briefly explain the role of the interface [2 marks]
- (ii) Network topology defines the structure of the network and can be broadly classified as either as physical, logical or hybrid topology. Briefly state how logical topology is different from physical topology and list two forms of logical topology [4 marks]

(c) Virtual Private Networks (VPN) uses encryption and security protocols to retain privacy while it accesses outside resources. Explain the roles of the Authentication, Confidentiality and Integrity in securing data in VPNs. **[3 marks]**

(d) The diagram below illustrates how node to node delivery of frames is implemented at data link layer. Briefly describe the process of frame transfer. **[7 marks]**



### QUESTION FIVE [20 MARKS]

(a) State the meaning of the following terminologies applicable in computer networking

- i. Computer network
- ii. Wireless network

**[2 marks]**

**[2 marks]**

(b) (i) Briefly state the function of the network media in computer networking

**[2 marks]**

(ii) Wired media is the most widely adopted family in local area network (LAN) technology are collectively known as Ethernet, described by a set of standards together called IEEE 802.3. State the two types of wired media that have been adopted

**[2 marks]**

(c) (i) Asynchronous Transfer Mode (ATM) is a communication protocol that uses asynchronous time-division multiplexing and encodes data into small, fixed-sized cells. State the kind of traffic that ATM communication protocol would be appropriately applicable

**[4 marks]**

(ii) Packets are always created at the source and each host device creates their own routing table. State three ways in which a host can send packets.

**[3 marks]**

(d) We want to send data from a node with network address A and physical address 10, located on one LAN, to a node with a network address P and physical address 95, located on another LAN. What we need here are universal addresses that can pass through the LAN boundaries i.e. network (logical) addresses. Using the diagram, illustrate how this is achieved at the network layer. **[5 marks]**