1. ***[5 marks]* Is Token Ring Data-Link protocol point-to-point or multi-access?**
2. ***[5 marks]* What framing technique does Token Ring use?**
3. ***[5 marks]* Create a simple diagram of the structure of a frame for Token Ring that includes the name, size, and position of all fields…**
4. ***[5 marks]* Provide a description of the purpose of each field in the frame…**
5. ***[5 marks]* What kind of network is Token Ring primarily used in? (LAN/WAN/etc.)**
6. ***[5 marks]* Explain why Token Ring is used for the kind of network you have indicated…**

MUST INCLUDE AN EXPLANATION / EXAMPLE

**a)** Token Ring networks utilise Media Access Control (MAC) addresses to manage and transmit data within a Local Area Network (LAN) between hosts. **Token Ring is an implementation of point-to-point communication ()**.

A Token Ring network typically consists of stations connected in a ring or, more commonly, a star topology, where all stations are connected sequentially. Therefore, each station is connected to a total of two other stations, the previous and next station in the network. A token is the frame of which stations can read and write data to and then be transmitted throughout the network. Tokens are passed sequentially from one host to the next and circulate around the network. This is called Token Passing.

When a station looks to transmit data, first they must receive an empty token which is circulating in the network. This station can then insert their data into the token and pass the data to the next station in the network. When a station receives a token that is not destined for them, they will not alter the token and just pass the token to the next station. When the token eventually arrives at the token’s desired destination, the data will be read, an acknowledgement flag to the end of the frame and the Token Passing process will continue. Finally, the token will reach the sending station that originally set the data in the token, see that the acknowledgement flag exists and remove the data from the token, transforming it back into an empty token. Finally, the Token Passing process will continue allowing other stations to use the empty token for their own data transmission within the network. This demonstrates the point-to-point communication functionality of a Token Ring network.

a)

Within networking, frames are a standardised data structure used to send and receive data within a network. This is a crucial aspect of a network and allows all hosts of a network to identify key blocks of information within a stream of bits. Token ring operates

b)

A picture containing graphical user interface

Description automatically generated

A picture containing graphical user interface

Description automatically generated

c)

<https://www.ibm.com/docs/en/i/7.2?topic=standards-token-ring-networks> (IBM - Token Ring)

<https://www.pcmag.com/encyclopedia/term/token-ring> (Token Ring)

<https://www.blackbox.be/en-be/page/25363/Resources/Technical-Resources/Black-Box-Explains/networking-standards/token-ring> (Token Ring)

<https://www.techtarget.com/searchnetworking/definition/Token-Ring> (Token Ring)

<https://computer.howstuffworks.com/ethernet17.htm> (frame gives permission to transmit – token passing method)

<https://www.geeksforgeeks.org/token-ring-frame-format/> (Token Ring Frame Format)

<https://www.youtube.com/watch?v=5F_IBfqt-Cs> (Token Ring Frame Format)

<https://www.tutorialspoint.com/framing-in-data-link-layer> (Bit / Byte Stuffing)

<https://learning.oreilly.com/library/view/fundamentals-of-data/9781119436256/c03.xhtml#c03_level1_3> (Textbook – Bit stuffing, framing)

<https://www.geeksforgeeks.org/bit-stuffing-in-computer-network/> (Bit Stuffing)

<https://www.tutorialspoint.com/what-are-the-token-ring-frame-formats-in-computer-network> (Token Ring Format GOOD)

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj7q8Xq6_P0AhUPSGwGHUFiCjgQFnoECA4QAw&url=https%3A%2F%2Fwww.unf.edu%2F~sahuja%2Fcnt5505%2FTokenRing.pdf&usg=AOvVaw3ppiI2yCMMs03rIXWhMAoe>

* PDF
* Token Ring PPT
* **Says the words Point-to-point**

<https://flylib.com/books/en/1.180.1.20/1/> (Massive document all about Token Ring)

<https://www.geeksforgeeks.org/framing-in-data-link-layer/> (