AT&T Technical Knowledge (TKT) II Practice Test (Sample)

Study Guide

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Questions

1. What is subnetting?

A. The process of encrypting network traffic.

B. Dividing a network into smaller, more manageable sub-networks to improve performance and security.

C. Connecting various devices using wireless technology.

D. A method for increasing data transmission speed.

2. When the applied frequency is increased in a circuit containing an inductor and a capacitor, what happens to inductive reactance?

A. Decreases

B. Increases

C. Remains the same

D. Becomes negative

3. A capacitor opposes any change in _____.

A. Current

B. Voltage

C. Resistance

D. Power

4. What term describes the transmission method where data is sent in bursts rather than continuously?

A. Full duplex

B. Asynchronous

C. Synchronous

D. Token passing

5. What is the measure of the opposition to current flow in a circuit?

A. Voltage

B. Current

C. Resistance

D. Power

6. Inductance is a quality of a circuit that opposes any changes in _____.

A. Current

B. Voltage

C. Resistance

D. Frequency

7. What type of circuit would you have if the current path is interrupted?

A. Closed circuit

B. Dummy circuit

C. Open circuit

D. Parallel circuit

8. In networking, what does the term "throughput" refer to?

A. The maximum speed of data transmission

B. The actual amount of data transmitted in a given time

C. The total number of users connected

D. The number of devices on the network

9. What determines the DC resistance of a conductor?

A. Length, thickness, and temperature

B. Length, voltage, and voltage drop

C. Thickness, temperature, and current

D. Length, diameter, and capacitance

10. What is a part of a computer system designed to block unauthorized access?

A. A router

B. A firewall

C. An antivirus

D. A switch

Answers

1. B
2. B
3. B
4. B
5. C
6. A
7. C
8. B
9. A
10. B

Explanations

1. What is subnetting?

A. The process of encrypting network traffic.

B. Dividing a network into smaller, more manageable sub-networks to improve performance and security.

C. Connecting various devices using wireless technology.

D. A method for increasing data transmission speed.

Subnetting is the process of dividing a larger, more complex network into smaller, manageable sub-networks, or subnets. This practice enhances both performance and security within the overall network architecture. By subdividing a network, it limits the number of devices in each subnet, which can decrease congestion and allow for more efficient data transmission. Additionally, subnets can enhance security by isolating different segments of a network, allowing for tailored security policies that are specific to the needs of those segments. The importance of subnetting becomes evident in larger networks, where it helps in organizing the IP address space more efficiently and facilitates better management of network resources. It improves routing efficiency, reduces broadcast traffic, and can simplify troubleshooting. The other choices reference different networking concepts: encrypting traffic relates to securing data, connecting devices wirelessly pertains to wireless communication technology, and increasing data transmission speed refers to improvements in data transfer rates rather than organizational structure in networking. Therefore, only the process of creating smaller sub-networks aligns precisely with the definition of subnetting.

2. When the applied frequency is increased in a circuit containing an inductor and a capacitor, what happens to inductive reactance?

A. Decreases

B. Increases

C. Remains the same

D. Becomes negative

Inductive reactance is a property of an inductor that describes its opposition to alternating current (AC) based on the frequency of the applied voltage. The formula for inductive reactance is given by $X_L = 2\pi fL$, where X_L is the inductive reactance, f is the frequency, and L is the inductance. As the frequency (f) increases, the inductive reactance (X_L) also increases proportionally. This relationship highlights that the higher the frequency applied to an inductor, the greater the opposition it provides to the current, resulting in increased inductive reactance. This behavior is crucial in AC circuit analysis, particularly in resonant circuits, where it is essential to understand how the reactance changes with varying frequencies to predict circuit behavior accurately. The other options don't align with this principle, as they suggest scenarios that do not occur with rising frequency in inductive circuits.

3. A capacitor opposes any change in _____.

A. Current

B. Voltage

C. Resistance

D. Power

The correct answer is that a capacitor opposes any change in voltage. Capacitors are devices used in electrical circuits to store and release energy. They do this by accumulating charge on their plates when a voltage is applied across them. When there is a sudden change in voltage—either an increase or a decrease—the capacitor reacts by either absorbing or supplying charge to maintain the voltage level across their terminals. This property is due to the capacitor's ability to store energy in the electric field created between its plates. As a result, capacitors resist changes in voltage, which is why they are often used in circuits to smooth out voltage fluctuations and ensure stable operation. This characteristic is significant in applications like filtering, timing, and energy storage. Other options like current, resistance, and power do not accurately describe the fundamental behavior of a capacitor. While capacitors do affect current in a circuit, they inherently oppose changes in voltage by design. Resistance is a property that describes how materials oppose the flow of charge, but it is not directly related to the action of a capacitor. Power is a measure of energy transfer over time, but capacitors themselves do not oppose changes in power directly; rather, their impact on the circuit influences power dynamics based on voltage and

4. What term describes the transmission method where data is sent in bursts rather than continuously?

A. Full duplex

B. Asynchronous

C. Synchronous

D. Token passing

The transmission method where data is sent in bursts rather than continuously is referred to as asynchronous transmission. In this method, data is sent in discrete packets or bursts, which are spaced out in time, allowing for intervals between the transmissions. Each burst of data is typically framed with start and stop bits that help the receiving system recognize the beginning and end of each piece of data. This approach is particularly beneficial for situations where the data may not need to be sent continuously, allowing for efficient use of the transmission medium. It can also accommodate varying data transmission rates and reduce the overhead associated with maintaining a continuous connection, which is a characteristic of synchronous communication methods. In contrast, full duplex refers to a mode where data transmission can occur in both directions simultaneously; synchronous transmission involves continuous data transfer with a consistent clock signal, and token passing is a network protocol that enables nodes to communicate by passing a token. These concepts, while related to data transmission, do not specifically describe the burst transmission characteristic outlined in the question.

5. What is the measure of the opposition to current flow in a circuit?

A. Voltage

B. Current

C. Resistance

D. Power

Resistance is the measure of the opposition to current flow in a circuit. It quantifies how much a circuit component resists the flow of electric current, which is a fundamental concept in electrical engineering and physics. Resistance is measured in ohms (Ω) and plays a key role in determining how much current will flow through a circuit for a given voltage according to Ohm's Law, which states that voltage equals current times resistance (V = I x R). In a circuit, higher resistance means less current will flow for a given voltage, while lower resistance allows more current to flow. This characteristic makes resistance crucial for controlling and managing the flow of electricity in various applications, such as in resistors and other components designed to limit current. Understanding resistance helps in designing circuits and troubleshooting electrical systems effectively. Other concepts such as voltage, current, and power are related but do not directly measure opposition to current flow. Voltage represents the electrical potential difference, current measures the flow of charge, and power indicates the rate at which electrical energy is consumed or transferred. Each concept plays a different role in the functioning of electrical circuits.

6. Inductance is a quality of a circuit that opposes any changes in _____.

A. Current

B. Voltage

C. Resistance

D. Frequency

Inductance is a property of electrical circuits that specifically opposes any changes in current. This characteristic arises from the behavior of inductors, which store energy in a magnetic field when current flows through them. When there is a change in current—whether an increase or a decrease—the inductor generates an electromotive force (EMF) in the opposite direction, according to Lenz's law. This induced voltage acts to resist the change in current, effectively making it more challenging for the current to increase or decrease suddenly. This principle is fundamental in various applications, including transformers and inductive loads, where the control over current changes is crucial for functionality and stability. Understanding the role of inductance allows engineers and technicians to design more effective and reliable circuits. In contrast, while voltage may be affected by inductance, it is not the change in voltage that inductance directly opposes; rather, it is the change in current that the property is designed to counteract. Resistance, on the other hand, is a measure of how much a component opposes the flow of current without regard to changes in it. Frequency relates to the oscillations of current or voltage but does not specifically pertain to what inductance opposes in the same manner as current

7. What type of circuit would you have if the current path is interrupted?

A. Closed circuit

B. Dummy circuit

C. Open circuit

D. Parallel circuit

An open circuit is characterized by a break in the current path, preventing electric current from flowing. In an open circuit, the continuity is lost due to one or more components being disconnected or damaged, which effectively interrupts the flow of electricity. This is distinct from a closed circuit, where the path is complete and current flows freely. A dummy circuit, which is often used in theoretical or educational contexts, does not have practical power or load, meaning it may not function like a true circuit. Lastly, a parallel circuit refers to a specific configuration where components are connected across common points or junctions, allowing for multiple paths for current; however, if the circuit were interrupted, it too would become open. Therefore, when the current path is interrupted, it unequivocally results in an open circuit, confirming that this is the correct and appropriate answer.

8. In networking, what does the term "throughput" refer to?

A. The maximum speed of data transmission

B. The actual amount of data transmitted in a given time

C. The total number of users connected

D. The number of devices on the network

Throughput refers to the actual amount of data successfully transmitted over a network in a specific amount of time, typically measured in bits per second (bps) or its multiples, such as Mbps or Gbps. It represents the effective data rate that users or applications experience, taking into account any overhead, errors, or retransmissions that may occur in the communication process. Understanding throughput is essential for evaluating the performance of a network, as it provides insight into how much data can be processed and transferred under real-world conditions, unlike maximum speed figures, which can be theoretical and may not account for various factors affecting performance. The other options relate to different networking concepts. The maximum speed of data transmission refers to the highest possible speed a connection can achieve, which does not reflect real-world performance. The total number of users connected and the number of devices on the network deal with network capacity and resource management rather than the efficiency of actual data transmission. Hence, the focus on throughput gives a clear understanding of the network's capability in practical terms.

9. What determines the DC resistance of a conductor?

A. Length, thickness, and temperature

B. Length, voltage, and voltage drop

C. Thickness, temperature, and current

D. Length, diameter, and capacitance

The correct option highlights three key factors that influence the DC resistance of a conductor: length, thickness, and temperature. - Length: The resistance of a conductor is directly proportional to its length. This is because a longer conductor offers more material for the electrons to pass through, thereby increasing the likelihood of collisions with the atoms in the material, which contributes to resistance. - Thickness: Resistance is inversely proportional to the cross-sectional area (or thickness) of the conductor. A thicker conductor has a larger area for the electrons to flow through, which reduces the resistance. Essentially, more pathways for the electrons lead to lower resistance. - Temperature: The resistance of a conductor is also affected by temperature. As temperature increases, the atoms in the conductor vibrate more intensely, which can impede the flow of electrons and hence increase resistance. Conversely, at lower temperatures, resistance typically decreases. These three factors together capture how the physical characteristics of a conductor determine its ability to resist the flow of electric current. The other options include factors that do not directly impact DC resistance in the way that length, thickness, and temperature do, thereby confirming why this choice is the most accurate.

10. What is a part of a computer system designed to block unauthorized access?

A. A router

B. A firewall

C. An antivirus

D. A switch

A firewall is specifically designed to monitor and control incoming and outgoing network traffic based on predetermined security rules. Its primary function is to establish a barrier between a trusted internal network and untrusted external networks, such as the internet. Firewalls can prevent unauthorized access to or from a private network by filtering traffic based on various security rules, allowing legitimate traffic while blocking potentially harmful transmissions. In contrast, routers are responsible for directing data packets between networks but do not inherently provide the security functions of a firewall. Antivirus software is designed to detect and eliminate malicious software but does not block access to networks. Switches primarily function to connect devices within a network, allowing them to communicate, but they do not offer security features against unauthorized access. Thus, the role of a firewall aligns perfectly with the task of blocking unauthorized access, making it the correct choice.