

Quiz Grade: 70.0% (A)

Quiz Submission

The Circuit Analysis and Design

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Total Questions: 10

Course Information

Course Title: The Circuit Analysis and Design
Course Code: SCTCI 281
Credit Hours: 3

Quiz Questions, Student Answers, and Correct Answers

Question 1 of 10

Multiple Choice Question

What is the fundamental law governing the relationship between voltage, current, and resistance in a circuit?

Available Options:

(A) Ohm's Law ← STUDENT SELECTED ← CORRECT ANSWER

(B) Kirchhoff's Voltage Law

(C) Kirchhoff's Current Law

(D) Faraday's Law

Student's Answer: Option A: Ohm's Law

Correct Answer: Option A: Ohm's Law

Question 2 of 10

Multiple Choice Question

In a series circuit, how does the total resistance relate to the individual resistances?

Available Options:

(A) It is the sum of the individual resistances ← STUDENT SELECTED ← CORRECT ANSWER

(B) It is the reciprocal of the sum of the reciprocals of the resistances

(C) It is equal to the largest resistance

(D) It is equal to the smallest resistance

Student's Answer: Option A: It is the sum of the individual resistances

Correct Answer: Option A: It is the sum of the individual resistances

Question 3 of 10

Multiple Choice Question

Which component in a circuit stores electrical energy in an electric field?

Available Options:

(A) Resistor

(B) Capacitor ← STUDENT SELECTED ← CORRECT ANSWER

(C) Inductor

(D) Transistor

Student's Answer: Option B: Capacitor

Correct Answer: Option B: Capacitor

Question 4 of 10

Multiple Choice Question

What is the purpose of a diode in a circuit?

Available Options:

(A) To store energy

(B) To allow current to flow in one direction only ← STUDENT SELECTED ← CORRECT ANSWER

(C) To amplify signals

(D) To resist the flow of current

Student's Answer: Option B: To allow current to flow in one direction only

Correct Answer: Option B: To allow current to flow in one direction only

Question 5 of 10

Multiple Choice Question

Which of the following is a method for analyzing circuits that involves transforming a complex circuit into simpler series and parallel combinations?

Available Options:

(A) Nodal Analysis ← STUDENT SELECTED

(B) Mesh Analysis

(C) Thevenin's Theorem ← CORRECT ANSWER

(D) Superposition Theorem

Student's Answer: Option A: Nodal Analysis

Correct Answer: Option C: Thevenin's Theorem

Question 6 of 10

Multiple Choice Question

In AC circuits, what does RMS stand for?

Available Options:

(A) Root Mean Square ← STUDENT SELECTED ← CORRECT ANSWER

(B) Random Mean Square

(C) Relative Mean Square

(D) Rotational Mean Square

Student's Answer: Option A: Root Mean Square

Correct Answer: Option A: Root Mean Square

Question 7 of 10

Multiple Choice Question

What is the phase difference between voltage and current in a purely resistive AC circuit?

Available Options:

(A) 0 degrees ← STUDENT SELECTED ← CORRECT ANSWER

(B) 45 degrees

(C) 90 degrees

(D) 180 degrees

Student's Answer: Option A: 0 degrees

Correct Answer: Option A: 0 degrees

Question 8 of 10

Multiple Choice Question

In an RLC circuit, what effect does resonance have on impedance?

Available Options:

(A) It maximizes impedance ← STUDENT SELECTED

(B) It minimizes impedance ← CORRECT ANSWER

(C) It has no effect on impedance

(D) It doubles the impedance

Student's Answer: Option A: It maximizes impedance

Correct Answer: Option B: It minimizes impedance

Question 9 of 10

Text Answer Question

Explain the importance of Kirchhoff's laws in circuit analysis and provide an example of how one of the laws is applied.

Student's Answer:

KCL WHICH STATES THAT SUM OF CURRENTS AT A JUNCTION EQUALS ZERO KVL ,IN A CLOSED LOOP SUM OF VOLTAGES EQUAL ZERO KCL IS USED TO FIND UNKNOWN CURRENTS AND CURRENTS FOLLOWING IN MULTIPLE BRANCHES

Correct Answer:

Kirchhoff's laws are fundamental in circuit analysis as they provide rules for the conservation of charge and energy. Kirchhoff's Current Law (KCL) states that the total current entering a junction must equal the total current leaving the junction. An example of applying KCL is analyzing a node in a parallel circuit to ensure that the sum of currents entering and exiting the node is zero.

Question 10 of 10

Text Answer Question

Describe the process of using Thevenin's Theorem to simplify a circuit for analysis.

Student's Answer:

REMOVE LOAD RESISTOR CALCULATE THEVENIN VOLTAGE AND CURRENT CONNECT R THEVENIN TO V THEVENIN IN SERIES WITH R THEVENIN COMPUTE V AND I LOAD

Correct Answer:

Thevenin's Theorem simplifies a complex circuit to a single voltage source and series resistance. To apply it, identify the portion of the circuit to be replaced, remove the load, calculate the open-circuit voltage (Thevenin voltage), and find the equivalent resistance (Thevenin resistance) when all sources are replaced by their internal resistances. Reconnect the load to this simplified circuit for easy analysis.