Some Final Exam Questions

- The number of chords (links, kiriş) is the same as the number of linearly independent KCL equations. (false)

- The sum of the instantaneous powers of all elements in a circuit is zero for any given time. (true)

- In order to obtain the Thevenin equivalent for a 1-port circuit, one should set the values of all dependent and independent sources to zero and then calculate the equivalent resistor for the port. (false, should not set the dependent sources to zero!)

- In order to calculate the Norton current for a 1-port circuit, one should short-circuit the port using an ampermeter and measure/calculate the current value on the ampermeter. (true)

- The element equation of an inductor can be given as an algebraic equation between current and magnetic flux. (true)

- If the instantaneous power of an element is positive at a certain period of time, then the element produces energy during this time period. (false)

- For any circuit, the total electrical energy produced by all circuit elements in a given period of time is equal to the total electrical energy consumed by all circuit elements. (true) ( ) ( ) ( ) ( ) ( ) ( ) ( )
- For a circuit, let and ( ) be the vector of element voltages and the vector of element currents measured at time and , respectively. Then , if . (true)

- The instantaneous power of an element is given as the multiplication of the element voltage and current. (true)

- If the instantaneous power of an element is negative at a certain period of time, then the element produces energy during this time period. (true)

- For any circuit, the total electrical energy produced by all circuit elements in a given period of time is greater than the total electrical energy consumed by all circuit elements. (false)

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- For a circuit, let and ( ) ( ) be the vector of element voltages and the vector of element currents measured at time and , respectively. Then , if . (false)

- The instantaneous power of an element is given as the multiplication of the element voltage and charge. (false)