Enrollment No: _____   Exam Seat No:_____

C.U. SHAH UNIVERSITY
Summer Examination-2022

Subject Name: Circuit Theory

Subject Code: 4TE03CIT1   **Branch: B.Tech (Electrical)**

Semester: 3   **Date: 26/04/2022**   **Time: 02:30 To 05:30**   **Marks: 70**

Instructions:
    (1) Use of Programmable calculator & any other electronic instrument is prohibited.
    (2) Instructions written on main answer book are strictly to be obeyed.
    (3) Draw neat diagrams and figures (if necessary) at right places.
    (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**

  a) Unit of inductance is _____   **(1)**
      a) Weber
      b) Henry
      c) Farad
      d) Tesla

  b) If the resistances 3Ω, 5Ω, 7Ω, 9Ω are in series, then their equivalent resistance (Ω) is?   **(1)**
      a) 9
      b) 20
      c) 24
      d) 32

  c) Energy stored in an inductor is _____   **(1)**
      a) LI
      b) LI^2
      c) $LI/2$
      d) $LI^2/2$

  d) Resistance depends on the temperature of the conductor.   **(1)**
      a) True
      b) False

  e) Every circuit is a network, but all networks are not circuits.   **(1)**
      a) True
      b) False

  f) Which of the following is not an example of a linear element?   **(1)**
      a) Resistor
      b) Thermistor
      c) Inductor

d) Capacitor

g) Which of the following is an active element? **(1)**
 a) Resistor
 b) Inductor
 c) Capacitor
 d) OP-AMP

h) In Superposition theorem, while considering a source, all other voltage sources are? **(1)**
 a) open circuited
 b) short circuited
 c) change its position
 d) removed from the circuit

i) Mesh analysis is applicable for non-planar networks also. **(1)**
 a) true
 b) false

j) Kirchhoff's voltage law is based on principle of conservation of _____ **(1)**
 a) energy
 b) momentum
 c) mass
 d) charge

k) The maximum power is delivered from a source to its load when the load resistance is _____ the source resistance. **(1)**
 a) greater than
 b) less than
 c) equal to
 d) less than or equal to

l) If the source impedance is complex, then the condition for maximum power transfer is? **(1)**
 a) $ZL = ZS$
 b) $ZL = ZS*$
 c) $ZL = -ZS$
 d) $ZL = -ZS*$

m) The circuit in which current has a complete path to flow is called _____ circuit. **(1)**
 a) short
 b) open
 c) closed
 d) open loop

n) If the voltage-current characteristics is a straight line through the origin, then the element is said to be? **(1)**
 a) Linear element
 b) Non-linear element
 c) Unilateral element
 d) Bilateral element

Attempt any four questions from Q-2 to Q-8
Q-2   **Attempt all questions** **(14)**

a)	State and explain Norton's theorem.	**(7)**
b)	Write short note on Thevenin's theorem.	**(7)**

Q-3   **Attempt all questions**   **(14)**
a)	Write statement of superposition theorem and explain theorem with electriccircuit.	**(7)**
b)	State and explain maximum power transfer theorem.	**(7)**

Q-4   **Attempt all questions**   **(14)**
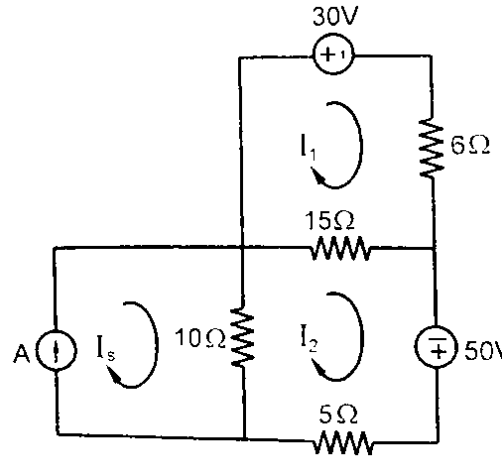|		
a)	Briefly explain about ideal current sources and ideal voltage sources.	**(7)**
b)	Determine the mesh current I_1 and I_2 in the network of fig 1 using mesh analysis.	**(7)**

Figure : 1

Q-5   **Attempt all questions**   **(14)**
a)	State and explain Telligent's theorem.	**(7)**
b)	State and explain Kirchhoff's Current Law and Voltage Law.	**(7)**

Q-6   **Attempt all questions**   **(14)**
a)	State and explain initial and final value theorem.	**(7)**
b)	Write short note on reciprocity theorem.	**(7)**

Q-7   **Attempt all questions**   **(14)**
a)	Write and explain relationship between Z parameters and Y parameters.	**(7)**
b)	Explain the classification of Time domain and Frequency domain analysis.	**(7)**

Q-8   **Attempt all questions**   **(14)**
a)	Derive formulae to convert given 'Y' parameters into 'h' parameters.	**(7)**
b)	Explain the concept of poles and zeros and their significance.	**(7)**