Enrollment No: _____ Exam Seat No:_____

C.U. SHAH UNIVERSITY

Summer Examination-2022

Subject Name: Fundamentals of Electrical Engineering

Subject Code: 4TE01FEE1 Branch: B.Tech (All)

Semester: 1 Date: 25/04/2022 Time: 11:00 To 02:00 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) Kirchhoff's laws are useful in determining—— (1)
(a) Current flowing in a circuit
(b) EMFs and Voltage drops in a circuit
(c) Power in a circuit
(d) All the above

b) Which of the following is not an expression of power? (1)
(a) $P=VI$
(b) $P=I^2R$
(c) $P=V^2/R$
(d) $P=I/R$

c) In dc circuits, we can improve the circuit power factor by capacitors. (1)
(a)True
(b) False

d) Kilowatt-hour (kWh) is a unit of? (1)
(a) Current
(b) Power
(c) Energy
(d) Resistance

e) Out of the following, which is not a source of electrical energy? (1)
(a) Solar cell
(b) Battery
(c) Potentiometer
(d) Generator

f) Ohm's law is not applicable to (1)

(a) DC circuits
(b) high currents
(c) small resistors
(d) semi-conductors

g) KCL is applied at (1)

(a) Loop
(b) Node
(c) Both loop and node
(d) Neither loop nor node

h) Capacitors charge and discharge in _____ manner. (1)

(a) Liner
(b) Constant
(c) Square
(d) Exponential

i) The reciprocal of resistivity is_____ (1)

(a) Conductance
(b) Resistance
(c) Conductivity
(d) Impedance

j) In a series circuit, which of the parameters remain constant across all circuit elements such as resistor, capacitor and inductor etcetera? (1)

(a) Voltage
(b) Current
(c) Both voltage and current
(d) Neither voltage nor current

k) What is the duration of one cycle known as (1)

(a) Waveform
(b) Peak value
(c) Instantaneous value
(d) Period

l) RMS stands for (1)

(a) Root Mean Square
(b) Root Mean Sum
(c) Root Maximum Sum
(d) Root Minimum Sum

m) In an inductive circuit, the current _____ the voltage? (1)

(a) Leads
(b) Lags

(c) Is greater than

(d) Is less than

n) What is the resonance condition? (1)

(a) When XL > XC

(b) When XL

(c) When XL = XC

(d) When XC = infinity

Attempt any four questions from Q-2 to Q-8

Q-2		**Attempt all questions**	**(14)**
	a)	Explain Kirchhoff's current and voltage law.	**(7)**
	b)	Give comparison of electrical and magnetic circuits.	**(7)**
Q-3		**Attempt all questions**	**(14)**
	a)	Briefly explain series and parallel connections of resistance.	**(7)**
	b)	Write short note on co-efficient of coupling.	**(7)**
Q-4		**Attempt all questions**	**(14)**
	a)	Draw and explain delta to star connection for resistance in electrical circuit.	**(7)**
	b)	Define average value and prove that average current =0.637 maximum current.	**(7)**
Q-5		**Attempt all questions**	**(14)**
	a)	Derive the equation for energy stored in capacitor.	**(7)**
	b)	Give definition of following: (1) Cycle (2) Instantaneous value (3) Maximum value (4) R.M.S. value (5) Frequency (6) Form factor (7) Peak factor	**(7)**
Q-6		**Attempt all questions**	**(14)**
	a)	Derive the relationship between voltage and current for a purely inductive circuit connected to dc supply. Also show that the average power consumed by a circuit is zero.	**(7)**
	b)	Draw a series R-C circuit and derive expression for its impedance and power factor triangle. Draw a phasor diagram for the circuit.	**(7)**
Q-7		**Attempt all questions**	**(14)**
	a)	Write short note on series resonance in ac series circuit.	**(7)**
	b)	Give advantages of 3-phase system over 1-phase ac system.	**(7)**
Q-8		**Attempt all questions**	**(14)**
	a)	Derive the condition for maximum efficiency in transformer.	**(7)**
	b)	Explain working of transformer on no load and load condition.	**(7)**