Enrollment No: _____ Exam Seat No: _____

C.U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Fundamentals of Electrical Engineering

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

Semester: 1 Date: 10/01/2023 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 Voltage Law is concerned with
(a)IR drops (b) Battery emfs (c) junction voltage (d) both (a) & (b)

b) Hysteresis loss in a magnetic material depends upon
(a) area of hysteresis loop (b) frequency of reversal of field
(c) Volume of Magnetic Material (d) all of the above

c) The resistances are having addition in _____ circuit
(a) Series (b) Parallel
(c) Both series and parallel (d) None of them.

d) Select the energy Storing elements from the following
(a) Resistor (b) Capacitor
(c) Both of above (d) None of above

e) The statement for Kirchhoff's Voltage law is represented by
(a) V1 + V2 + V3 = 0 (b) R1 + R2 + R3 = 0
(c) I1 + I2 + I3 = 0 (d) None

f) The frequency term is related with
(a) D.C Circuits b) A.C. Circuits c) Both d) Independent Term

g) Which element can be used as voltage Source
(a) Battery (b) Analog meters
(c) Inductor (d) None ot above

h) Define the term Electric flux.

i) State Ohm's law.

j) Define the term Electric field intensity.

k) Give definition of voltage.

l) Write condition of series resonance.

m) Define active power in ac system.

n) What is power factor?

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

Q-2		**Attempt all questions**	**(14)**
	a)	Give the comparison between electrical circuit & magnetic circuit.	**(7)**
	b)	Explain with neat and clean diagram of star to delta transformation.	**(7)**
Q-3		**Attempt all questions**	**(14)**
	a)	Explain briefly about Faraday's laws of electromagnetic induction.	**(7)**
	b)	Derive the equation for the co-efficient of coupling of two magnetically coupled coils A and B.	**(7)**
Q-4		**Attempt all questions**	**(14)**
	a)	State and explain the Kirchhoff's current and voltage laws.	**(7)**
	b)	Derive equation for charging of capacitor in RC circuit. Also define time constant of circuit.	**(7)**
Q-5		**Attempt all questions**	**(14)**
	a)	Define following terms in connection with A.C wave forms: (i) Frequency (ii) Phase difference (iii) Time Period (iv) form factor(v) Peak factor (vi) R.M.S.Value (vii) Average Value	**(7)**
	b)	Prove that current through pure inductor is always lagging by 90^0 to its voltage and power consumed is zero.	**(7)**
Q-6		**Attempt all questions**	**(14)**
	a)	Three coils each with a resistance of 20Ω and reactance of 20Ω are connected in star across a three phase, 50 Hz, 400V supply. Calculate (a) line current (b)reading on the two wattmeter to measure the power.	**(7)**
	b)	Compare series and parallel resonant circuits.	**(7)**
Q-7		**Attempt all questions**	**(14)**
	a)	Draw and explain the equivalent circuit of single phase transformer.	**(7)**
	b)	Draw and explain the vector diagrams when transformer is on ON-Load condition.	**(7)**
Q-8		**Attempt all questions**	**(14)**
	a)	Explain the method of measuring 3-Φ power by two wattmeters.	**(7)**
	b)	Derive the relation between phase and line values of voltages and currents in balanced star connection. Draw complete phasor diagram of voltages and currents.	**(7)**