Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name: Fundamental Electrical Engineering
Subject Code: 4TE01FEE1 Branch: B.Tech(All)
Semester: 1 Date: 25/04/2016 Time: 10:30 To 1:30 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) A Network Contains linear resistors and ideal voltage sources. If values of all the resistors are doubled then the voltage across each resistor is
(a)Halved (b) doubled (c) increased by four times (d) not changed

b) When temperature is decreased , the resistance of carbon & tungsten respectively,
(a)Increase, decreases (b)Increase, Increase (c)decreases, Increase (d)decreases, decreases

c) Kirchhoff's Voltage Law is concerned with

(a)IR drops (b) Battery emfs (c) junction voltage (d) both (a) & (b)

d) Two 2 KΩ, 2W resistors are connected in parallel, Combined resistance and wattage ratings will be
(a)4KΩ,4W (b) 1 KΩ ,4W(c) 1KΩ,2W (d) 1kΩ,1W

e) If a dielectric field is placed in an electric Field , the field strength
(a) Decreases (b) increases (c) Remains the same (d) Becomes zero

f) Define the term Electric flux

g) Define the term Electric field intensity.

h) 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

i) For a series resonance circuit at low frequency, circuit impedance is _____ and at high frequency circuit impedance is_____.
(a) capacitive, inductive (b) inductive, capacitive (c) resistive, inductive(d) capacitive, resistive

j) In the two wattmeter method of measurement ,if one of the wattmeter reads zero, then power factor will be
(a)zero (b) unity (c) 0.5 (d) 0.866

k) One electron volt (1 eV) is equivalent to ___joules.
(a) $1.3*10^{-19}$ (b) $1.4*10^{-19}$ (c) $1.5*10^{-19}$(d) $1.6*10^{-19}$

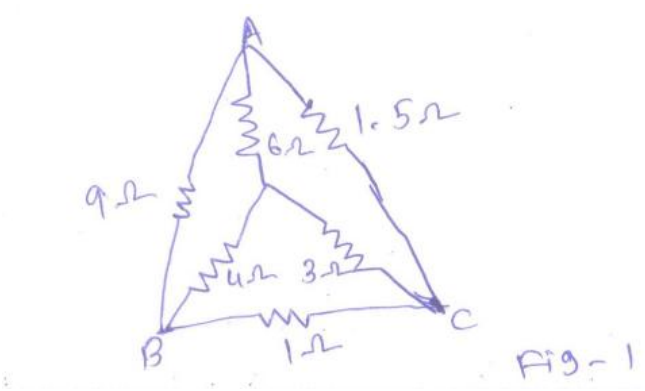
l) State Ohm's law.

m) Define permittivity.

n) A Capacitor can ____ .
(a) Blocks both a.c. and d.c. (b)Passes d.c. but blocks a.c. (c)Passes a.c. but blocks d.c. (d) Passes both ac and dc

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

Q-2		**Attempt all questions**	**(14)**
	(a)	Explain effect of temperature on resistance. Define temperature co-efficient. Obtain expression $\alpha t_2 = \frac{1}{\frac{1}{\alpha t_1}+(t_2-t_1)}$.	**05**
	(b)	Derive expression for delta to star conversion of resistive network.	**05**
	(c)	Derive an expression for energy stored in capacitor.	**04**
Q-3		**Attempt all questions**	**(14)**
	(a)	A Coil has a resistance of 18Ω when its mean temperature is 20c, and of 20Ω when its temperature is 50°c. Finds its mean temperature rise when its resistance is 21Ω and the surrounding temperature is 15 ^{0} C.	**05**
	(b)	Explain Magnetic Hysteresis.	**05**
	(c)	What is capacitor? Derive the expression for the equivalent capacitance of capacitors connected (i) in parallel (ii) in series	**04**
Q-4		**Attempt all questions**	**(14)**
	(a)	Find an Equivalent resistance between A and B in Fig.1.	**05**



	(b)	Derive equation for charging of capacitor in RC circuit.	**05**
	(c)	With reference to electrostatic and capacitance: (i) State Coulomb's 1st & 2nd laws.	**04**
Q-5		**Attempt all questions**	**(14)**
	(a)	Define following terms in connection with A.C wave forms : (i) Frequency (ii) R.M.S.Value (iii) Time Period (iv) form factor(v) Peak factor	**05**
	(b)	Derive the equation for the co-efficient of coupling of two magnetically coupled coils A and B.	**05**
	(c)	Compare Electric and Magnetic circuits	**04**
Q-6		**Attempt all questions**	**(14)**
	(a)	Discuss Series R-C Circuit with phasor diagram, impedance and waveform of the	**08**

		circuit.	
	(b)	Compare series and parallel resonant circuits.	**06**
Q-7		**Attempt all questions**	**(14)**
	(a)	Explain the method of measuring 3-Φ power by two wattmeters.	**05**
	(b)	Three coils each with a resistance of 10Ω and reactance of 10Ω are connected in star across a three phase, 50 Hz, 400V supply. Calculate (i) line current (b) reading on the two wattmeters to measure the power.	**05**
	(c)	What are the advantages of a three phase system?	**04**
Q-8		**Attempt all questions**	**(14)**
	(a)	Explain Construction and working principle of single phase transformer.	**05**
	(b)	Draw and explain the vector diagrams when transformer is on ON-Load condition.	**05**
	(c)	Derive the E.M.F equation of a transformer.	**04**