Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2019

Subject Name: Fundamental of Electrical Engineering

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

Semester : 1 Date : 19/11/2019 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) The resistance of a 100 W, 200 V lamp is
(a) 100 Ω (b) 200 Ω (c) 400 Ω (d) 300 Ω

b) Which of the followings is/are active element?
(a) Voltage source (b) current source (c) both (d) None of these

c) Kirchhoff's voltage law is concerned with
(a)IR drops (b) Battery emfs (c) junction voltage (d) both (a) & (b)

d) Four capacitors each of 40 μF are connected in parallel, the equivalent capacitance of the system will be
(a)160 μF (b)10 μF (c)40 μF (d)5 μF

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) To obtain a high value of capacitance, the permittivity of dielectric medium should be
(a)low (b)zero (c)high (d)unity

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) Statement of KCL.

m) Magnetic flux has the unit of
(a) Netwon (b) Ampere turn (c)weber (d) tesla

n) The resistivity of the conductor depends on
(a) area of the conductor. (b) length of the conductor. (c) type of material (d) none of the above

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 $\alpha t_2 = \frac{1}{\frac{1}{\alpha t_1}+(t_2-t_1)}$.	**07**
	(b)	Derive expression for delta to star conversion of resistive network.	**07**
Q-3		**Attempt all questions**	**(14)**
	(a)	A lamp rated at 100 V, 75W is to be connected across 230V supply. Find the value of resistance to be connected in series with the lamp. Also find the power loss occurring in the resistor.	**07**
	(c)	What is Resistor? Derive the expression for the equivalent Resistance of resistor Connected (i) in parallel (ii) in series	**07**
Q-4		**Attempt all questions**	**(14)**
	(a)	Determine the capacitance of a parallel plate capacitor with each plate having an area of 10 cm^2, the distance between the plates being 0.1 mm.The dielectric between the plates has relative permittivity of 3. Determine (i) capacitance (ii) charge on the capacitor,(iii) the electrics flux density and (iv) energy stored if 100V is applied to the capacitor.	**07**
	(b)	Derive equation for charging of capacitor in RC circuit. Also define time constant of circuit.	**07**
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 (vi)Phase (vii)Power	**07**
	(b)	Compare Electric circuit with Magnetic circuits.	**07**
Q-6		**Attempt all questions**	**(14)**
	(a)	Discuss Series R-L Circuit with phasor diagram, impedance and waveform of the circuit.	**07**
	(b)	Compare series and parallel resonant circuits.	**07**
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.	**07**
	(b)	Derive the E.M.F equation of a transformer.	**07**