Exam.Code:0905
Sub. Code: 6659

2072

B.E. (Electrical and Electronics Engineering)

First Semester

EE-E 101: Basic Electrical Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) Define self and mutual inductance in electrical circuits. What do you mean by coefficient of coupling?

b) State and prove superposition theorem with the help of suitable example.

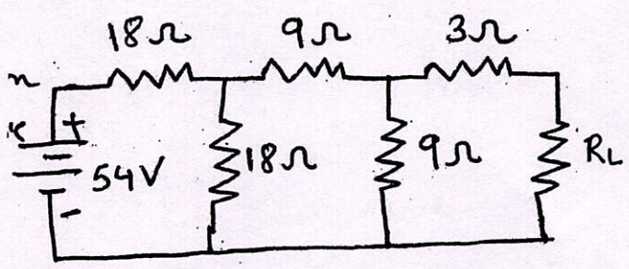
c) Write the application of D.C. series, shunt and compound motor.

d) The knowledge of phase sequence is very important in industries and power system. Why?

e) While performing short circuit test, rated voltage is never applied to the transformer, why? (5x2)

UNIT - I

II. For the network shown in figure below:-



Determine the current flowing through R_L when the value of load resistant is

a) 3 ohm

b) 6 ohm

c) 9 ohm (10)

III. a) Explain why the phaser of voltage across an inductor leads its current by 90^0 and the phasor of voltage across a capacitor lags its current by 90^0.

b) A coil of resistance 15 ohms and inductance 0.05 Henry is connected in parallel with a non-inductive resistor of 20 ohms. Find current in each branch, total current supplied, phase angle of combination when voltage 230V at 50 Hz is applied. Draw relevant phasor diagram. (2x5)

IV. a) How is power factor of a 3-phase balanced load can be determined using two-wattmeters?

b) A 3-ϕ, 500 V motor load has a power factor of 0.4. Two wattmeters connected to measure power show the input as 30kW. Find reading in each wattmeter. (2x5)

P.T.O.

UNIT - II

V. Does a magnetic circuit consume energy? Explain why? In a magnetic material hysteresis loss can not be reduced to zero, why? Also make a comparison between electric and magnetic circuits. (10)

VI. a) Define efficiency of a transformer and find the condition for obtaining maximum efficiency.

b) Calculate value of voltage regulation at 0.8 p.f. lagging for a transformer with resistance drop 2% and reactance drop 4% of the voltage. (2x5)

VII. Write note on the following:-

a) Single line diagram of distribution network

b) Operating principle of 3-ϕ induction motor (2x5)

x-x-x