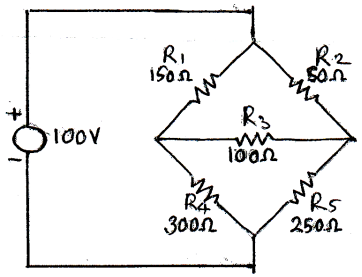


Q-6 (a) A coil of resistance 10 Ω and an inductance of 200 mH is connected in series with a capacitance of 20μF across 200V, 50 Hz, ac supply. Calculate (i) Magnitude of current. (ii) Power factor. (iii) Voltage across each element (iv) Phasor diagram of the circuit. (10)

(b) An impedance of 4-j 10 Ω is connected in parallel with impedance 6+j 8Ω. The circuit is fed from 230 V, 50 Hz supply. Find current through each branch, total circuit current and circuit impedance. (10)

Q-7. (a) The load in each branch of a delta connected balanced three phase circuit consists of an inductance 0.0318 H in series with a resistance of l0 Ω. The line voltage is 400 V at 50 Hz. Calculate the line current and total power in the circuit. (10)

(b) A three phase 230 V load has a power factor of 0.7. Two wattmeter's are connected to measure the power which shows the input to be 10 KW. Find the reading of each wattmeter. (10)

Q-8. (a) An iron ring of 10 cm^2 cross section and 100 cm mean circumference has 0.2 cm wide saw cut made in it. A flux of 1 milli Wb is required in an air-gap. The leakage factor is 1.2 and iron is such that flux density of 1.2 Wb/m^2 the relative permeability μ_r = 400. Calculate the number of ampere turns required (10)

(b) Compute the hysteresis loss of a magnetic material. (10)

Roll No. ……..

Lingaya's University, Faridabad
B.Tech. 1st Year (Term –III)
Examination – May, 2010
Electrical Engineering (EL-101)

[Time: 3 Hours] **[Max. Marks: 100]**

Before answering the question, candidate should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after examination.

Note: All questions carry equal marks. Attempt five questions. Question 1 is compulsory. Select two questions from Section B & two from Section C.

SECTION – A

Part-A

Q-1 Fill in the blanks with the appropriate answer from the choices given. (1x10=10)

(i) An ideal voltage source should possess _____ source resistance.

(a) Infinite (b) zero (c) finite value (d) none of the above

(ji) The number of equations required to solve a network by mesh analysis is equal to number of _____

(a) no. of loops (b) no. of meshes
(c) no. of branches (d) no. of junctions

(iii) The unit of magnetic flux density is _____

(a) Webers (b) $Webers/m^2$ (c) Siemens (d) Joules

(iv) The power factor of a purely resistive circuit is _____

(a) logging (b) leading (c) zero (d) unity

(v) A series resonant circuit is _____ for a frequency greater than resonant frequency

(a) resistive (b) inductive (c) capacitive (d) none of the above

(vi) The speed of dc motor can be changed by varying _____

(a) armature control method only

(b) field control method only (c) voltage control method only

(d) armature control, field control, voltage control method

(vii) An open circuit test on transformer is performed to measure _____ losses.

(a) Core losses (b) Copper Losses
(c) Hysterics loss (d) Eddy current loss

(viii) When the induction motor is at stand still the slip is _____

(a) one (b) zero
(c) greater then one (d) less than one

(ix) The permanent magnet moving coil meter can measure only _____

(a) ac only (b) dc only
(c) ac and dc both (d) none of the above

(x) The current drawn by a dc motor at starting is:

(a) zero (b) very low (c) normal (d) very high

Part-B

(i) Define apparent power.

(ii) What is the condition for series resonance?

(iii) What are commutators in dc machines?

(iv) Write the expression for emf of a transformer.

(v) Write the relationship between line and phase quantities of voltages and current in star connection. (5x2=10)

SECTION –B

Q-2. (a What are the losses occurring in a transformer and how can these be minimized? (4)

(b) Derive the condition for maximum efficiency of a transformer. (10)

(c) Draw the phasor diagrams of actual transformer on all types of loads. (6)

Q-3. (a) Explain the principle of operation of induction motor with neat diagram. (10)

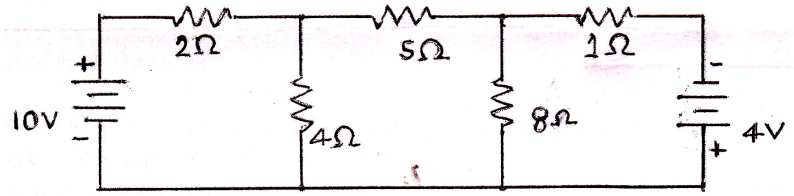
(b) Explain the constructional details of a dc machine with a neat diagram. (10)

Q-4. (a) With a neat diagram explain the principle and working of an induction type energy meter. (10)

(b) Write short notes on (i) B-H curve (ii) Eddy-current loss (5+5)

SECTION – C

Q-5. (a) Obtain the current in the 5 Ω resistor of the following network using nodal analysis (10)



(b) Obtain the current in the 100 Ω resistor in the following circuit using Thevenin's theorem. (10)