Uva Wellassa University, Sri Lanka
End Semester Examination – February/March 20
SCT 253-1 Applied Electricity and Repeat

Time: One (01) hour

Total 04 Questions.
Answer All questions.

1) a. Define the following terms with reference to sinusoidal alternating current.
   i. Average value
   ii. rms value

b. Determine the Average value, rms value for the wave form given in Fig Q1.

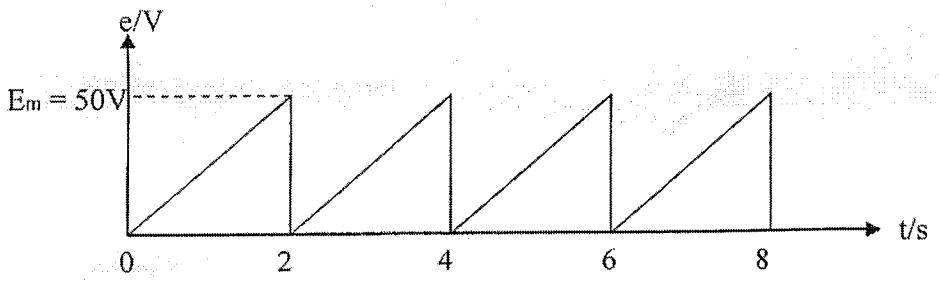
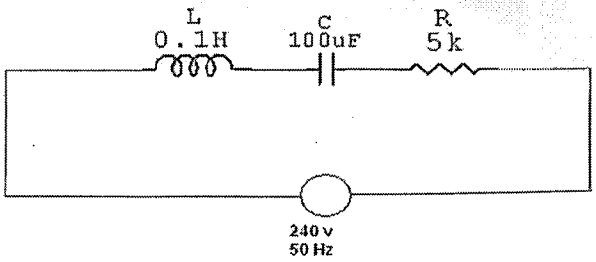


Fig Q1

(25 Marks)

2) a. Obtain an expression for resonant frequency (f_0) of a series L-C circuit.



FigQ2

b. A series resonant circuit has a 0.1 H inductance, a 100 μF capacitor and a 5 kΩ resistor connected across a 240 V, 50 Hz supply line. Calculate,
   i. inductive reactance
   ii. capacitive reactance
   iii. total impedance
   iv. current
   v. voltage across each part of the circuit
   vi. true power and power factor

(25 Marks)

3) A coil is wound uniformly with 200 turns over a steel ring of relative permeability 900 having a mean circumference length of 50 cm and a cross sectional area of 5 cm^2 (Fig Q3). If the coil has a resistance of 125Ω and is connected to 250 V DC supply, calculate

a. Current through the coil
b. The coil m.m.f.
c. The coil magnetic field strength
d. Total magnetic flux
e. Reluctance of the ring

Where permeability of free space is(μ_0) = $4\pi \times 10^{-7}$ H/m

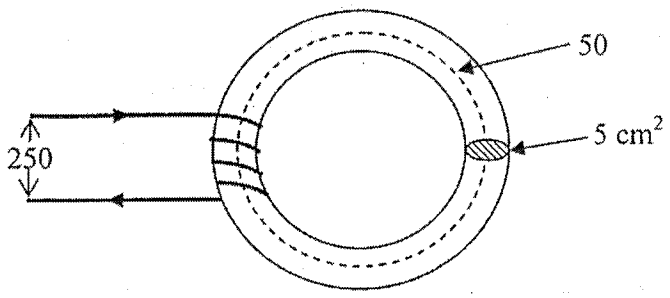
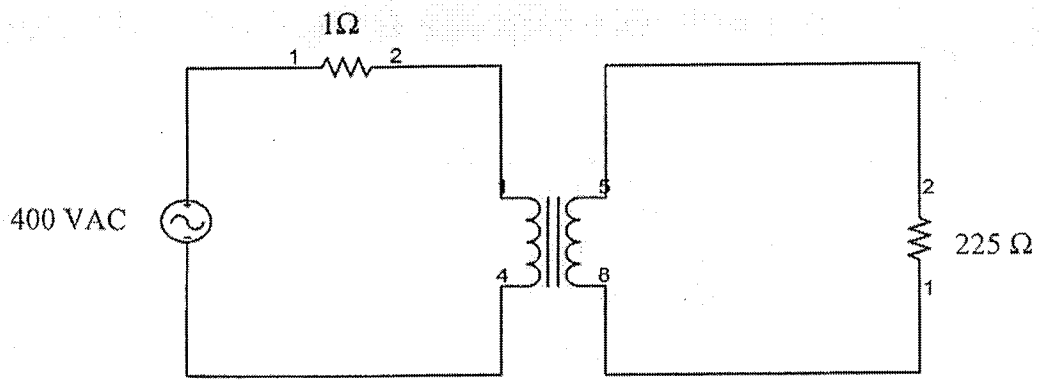


Fig Q3

(25 Marks)

4) a. Briefly explain the losses of the transformer

b. A single phase 400/2000 transformer has a resistance of 1Ω connected in series with primary winding and a 225 Ω resister connected across its secondary winding. Calculate the current in the secondary side when the circuit is supplied at 400 VAC.



400/2000

(25 Marks)