Exam.Code:0906
Sub. Code: 6829

2071

B.E. (Electrical and Electronics Engineering)

Second Semester

EEEC-201: 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 Part.*

x-x-x

1. (a) Write about different phases of power system.
   (b) Explain limitation of short circuit test of transformer.
   (c) Why rating of transformer is in kVA instead of kW?
   (d) Compare electric and magnetic circuits.
   (e) Write about the role of step-up and step-down transformers in AC transmission networks. (5*2)

PART-A

2. (a) Find all node voltages and all element currents using nodal analysis.

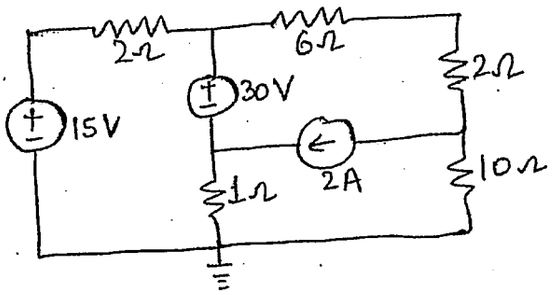

fig. 1.

(b) Determine Thevenin's equivalent circuit with respect to terminals AB and hence find current through 10 Ω resistor.

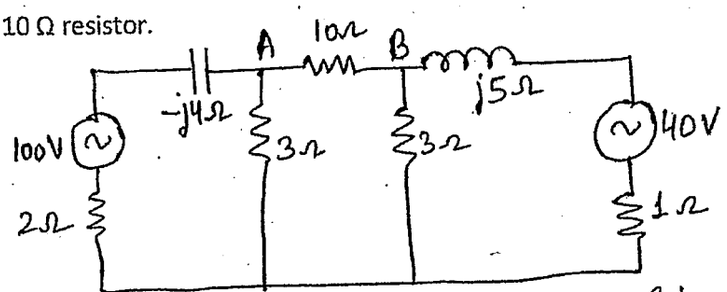

fig-2.

(5, 5)

3. (a) A coil having resistance of 12 Ω and inductance of 0.05 Ω, and non-inductive resistor of 20 Ω resistance and a loss free capacitance of 40 μF are connected in series across 240 V, 50 Hz supply. Find (i) current (ii) voltage across coil and capacitor (iii) power consumed in the circuit (iv) power consumed in coil (v) p.f. of circuit.

(b) Find R_1 for maximum power dissipation in it. Use Thevenin's equivalent circuit for its solution.

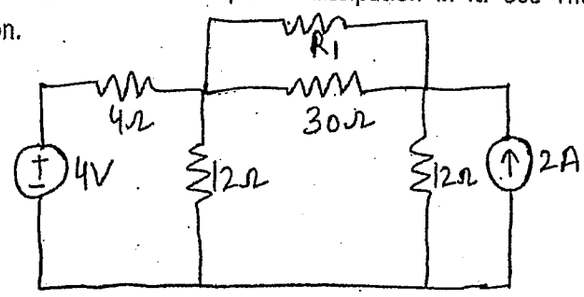

fig 3

(5, 5)

P.T.O.

4. (a) Find RMS and average values for the following figure. Also, find peak factor and form factor.

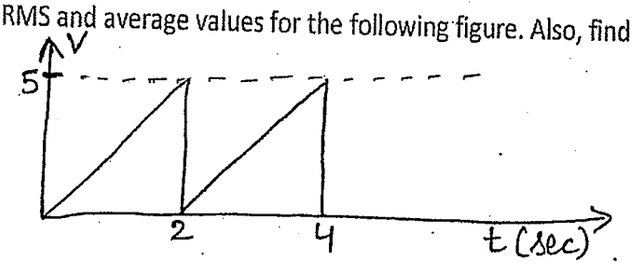

Fig. 4.

(b) a symmetrical 3-Φ load 400 V system supplies a balanced delta connected load. The current in each branch is 15 A and phase angle is 23° lagging. Find parameters of the load in each phase, line current and total power. (5, 5)

PART-B

5. A coil of 100 turns and resistance of 10Ω is wound uniformly on an iron ring of mean circumference 40 cm and cross-section area of 80 cm2. It is connected to 20 V dc supply. Under these conditions, μr of iron is 400. Find values of mmf, magnetizing force, total flux of iron, reluctance of the ring. (10)

6. Give construction features of Dc machines and explain materials used for each part. Deduce relation for back emf in dc machine. How can we find direction of dc motor? (10)

7. (a) A 10 kVA 1-Φ transformer for 2000V/400V at no-load has $R_1 = 5.5\Omega$, $X_1 = 12\Omega$, $R_2 = 0.2\Omega$, $X_2 = 0.45\Omega$. Determine apparent value of secondary voltage at full-load , at 0.8 p.f. lagging, when primary applied voltage is 2000 V. Also find voltage regulation and efficiency of transformer.

(b) Draw and explain 1-line diagram of power transmission network having different voltage levels to suit different applications. (5, 5)

x-x-x