TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

2076 Chaitra

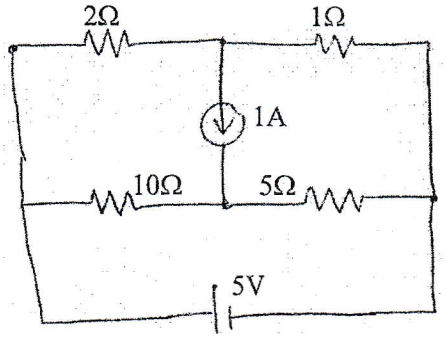
Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEL, BEX, BEI, BCT, BAM, BIE, BAG, BAS, BCH	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

Subject: - Basic Electrical Engineering *(EE 401)*

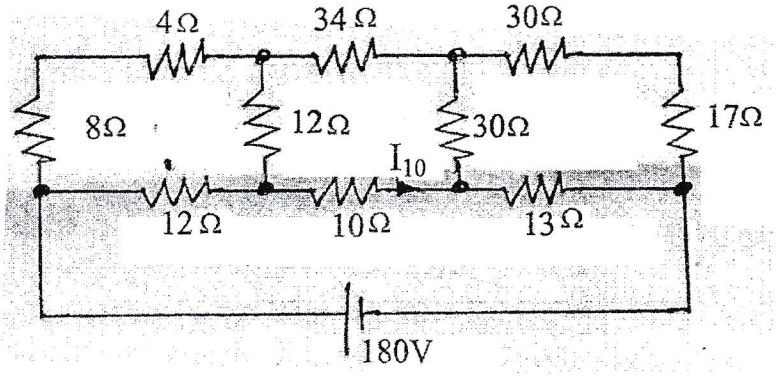
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

1. a) What do you mean by ideal and practical voltage source? Explain the effect of an internal resistance of voltage and current sources on their terminal characteristics. [4+4]

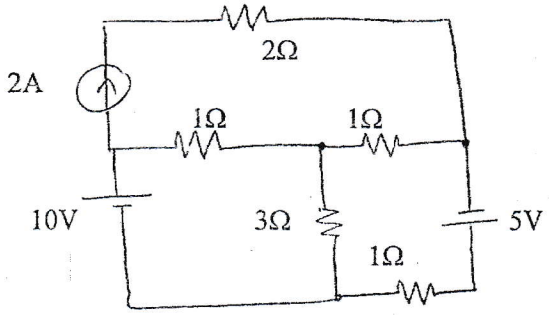
   b) Using loop current method, determine the current through 5Ω resistor in the circuit below. [8]



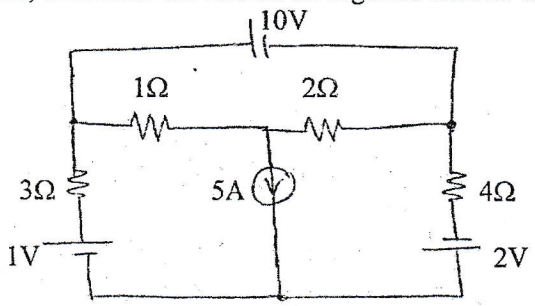
2. a) Find the I_{10} using Y/Δ transformation method, in the network given below. [8]



   b) Find the current though 3Ω resistor using Thevenin's theorem. [8]



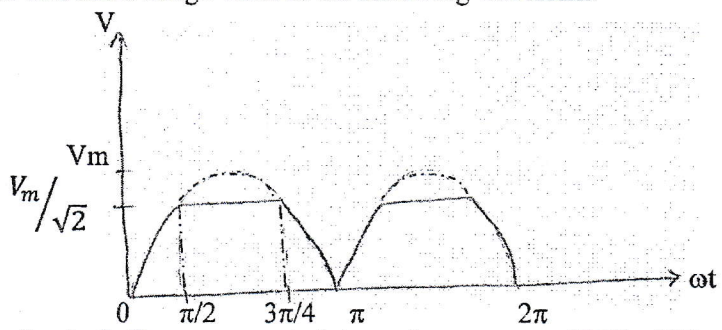
3. a) Using Nodal analysis, determine the current through 2Ω resistor in the circuit below. [8]



b) What is a self inductance? Derive the expression of equivalent inductance, when the two inductances are connected in series (opposing). [4]

c) "The average power over complete cycle in a purely inductive circuit is zero". Justify with necessary waveforms and mathematical expression. [4]

4. a) Find the rms and average value of the following waveform. [8]



b) Two coils A & B are connected in series across a 230V, 50Hz ac supply. The resistance and inductance of coil A & B are 5Ω and 0.018H respectively. The input from the supply is 2KW and 2kVAR, find the inductance of coil A and resistance of coil B. Also calculate the voltage across each coil. [8]

5. a) A two wattmeters measured an input power of 30KW and 40KW respectively to a motor. If the power factor of the motor be changed to 0.85 leading, determine the two wattmeter readings. The total input power remains the same. Draw a phasor diagram for the second condition. [8]

b) Three loads 4-3j, 6+8j, and 8+6j are connected in delta to a 3-phase, 400V supply. Find phase currents, line currents and total power consumed. [8]

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