TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

2078 Kartik

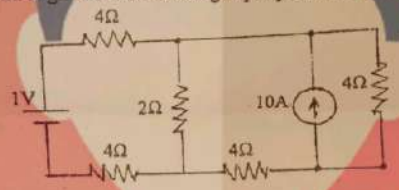
Exam.	Back		
Level	BE	Full Marks	80
Programme	BEL, BEX, BEI, BCT, BAM, BIE, BAG, BAS, BCH	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

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

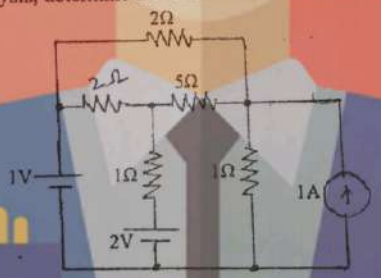
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt All questions.*
- ✓ *The figures in the margin indicate Full Marks.*
- ✓ *Assume suitable data if necessary.*

1. a) At 20°C, two coils connected in series having resistance of 600Ω and 300Ω respectively. The temperature coefficient at 20°C are 0.002/°C and 0.004/°C respectively for the coils. Find the resistance of combination at a temperature of 50°C. What is the effective temperature co-efficient of the combination at 50°C? [8]

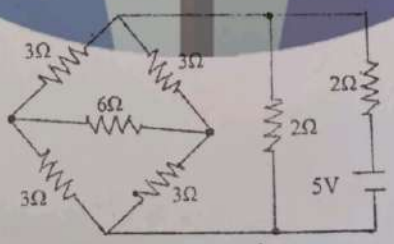
   b) Find the current through 2Ω resistor using super position theorem in the circuit below. [8]



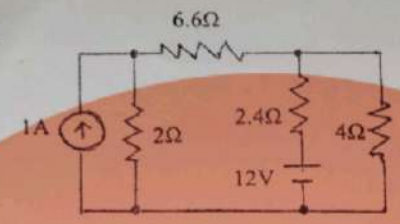
2. a) Using Nodal Analysis, determine the current in 5Ω resistor in the circuit below. [8]



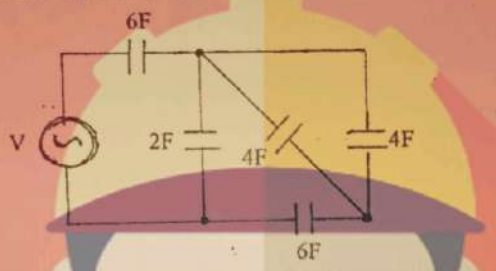
   b) State Thevenin's theorem. Determine the current through 6Ω resistor using Thevenin's theorem. [8]



3. a) Use Nortons theorem to calculate the current through 4Ω resistance in the circuit below. [8]

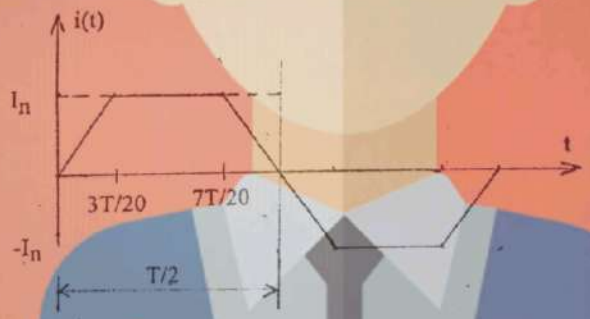


b) Calculate the equivalent capacitance in the circuit shown below. [4]



c) What are the drawbacks of low power factor? Explain a measure to improve power factor. [4]

4. a) Determine the rms and average value of the given waveform. [8]



b) Two circuits the impedances of which are given by Z_1=(10+j15) and Z_2=(6-j8) are connected in parallel. If the applied voltage to the combination is 230V, find (i) current and pf of each branch (ii) overall current and p.f. of the combination (iii) power consumed by each impedance and (iv) Draw the phasor diagram. [8]

5. a) Derive an expression to calculate the power factor of load (lagging) using two wattmeter meter readings. Also, explain the effect of power factor on wattmeter readings. [4+4]

b) Three loads 3+j5, 3-j4 nd 8+j6 are connected in delta to a 3-phase, 400V supply. Find the phase currents, line currents and total power consumed. [8]

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