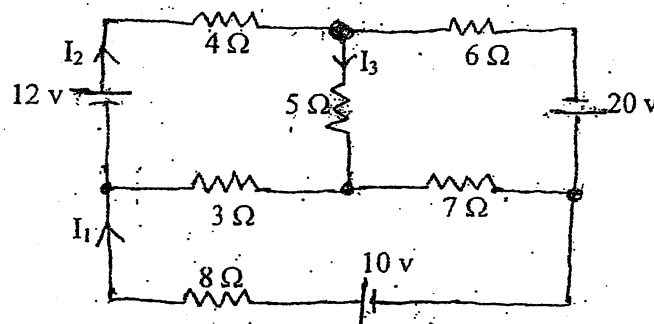


Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT, BIE, B.Agr.	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

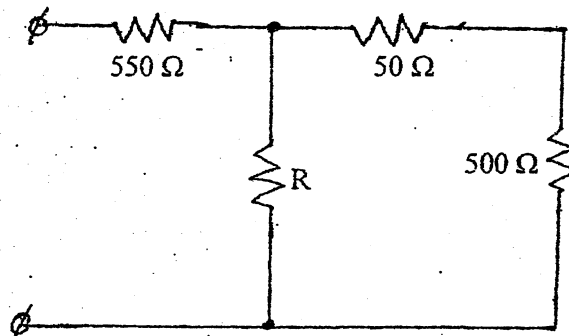
Subject: - Basic Electrical Engineering (EE401)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt any Five questions.
- ✓ All questions carry equal marks.
- ✓ Assume suitable data if necessary.

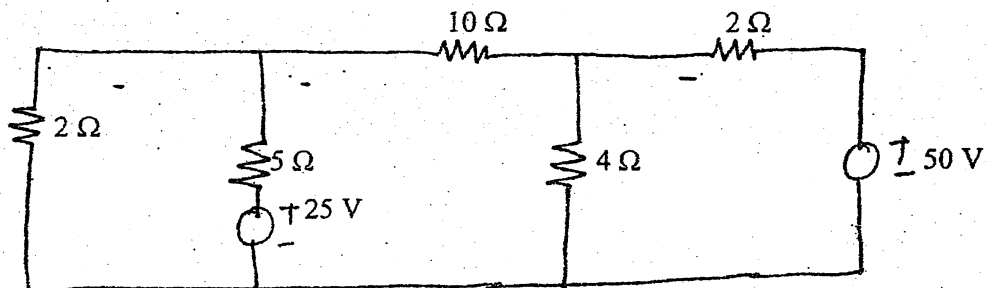
1. a) What is the difference between the potential difference and electromotive force? [4]
- b) Find I_1 , I_2 and I_3 in the circuit shown in the figure using Kirchhoff's law. [6]



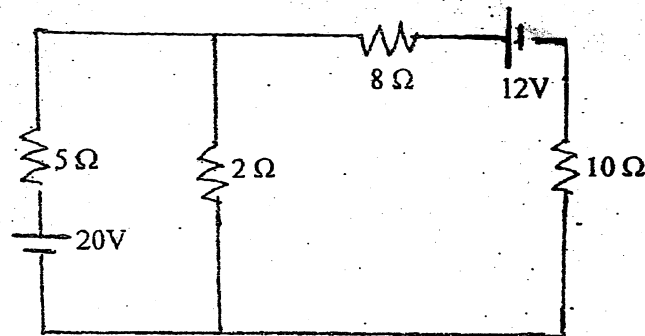
- c) What is the value of the unknown resistor 'R' in figure below, if the voltage drop across 500Ω resistor is 2.5 volts? [6]



2. a) Use the node voltage method (nodal) to find the current flowing through 10Ω resistor in the network shown figure below. [8]

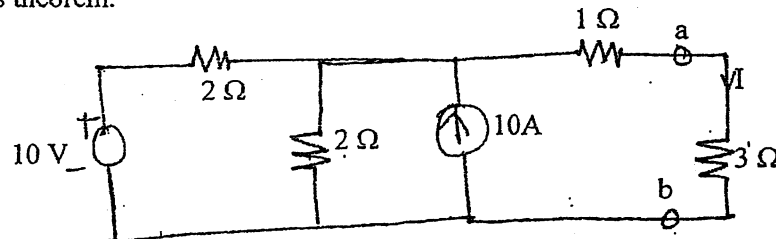


- b) For the circuit shown in figure below, calculate the current in the $10\ \Omega$ resistor using Thevenin's theorem.



3. a) Determine power dissipated in $3\ \Omega$ resistor in the circuit shown in figure below using Norton's theorem.

[8]



- b) An inductor is to be made with copper wire wound on a circular iron core having mean length of 40 cm with cross-sectional area of 50 sq mm. If the required value of inductance is 500 mH, calculate the number of turns required given that relative permeability of the core is 1500.
4. a) A 415 V, 3 phase, 50 HZ induction motor takes 50 KW power from supply mains at 0.72 power factor lagging. A bank of capacitors is connected in delta across the line to improve the overall power factor. Calculate the capacitance per phase in order to raise the power factor to 0.9 lagging.
- b) Three loads $(31+j59)\ \Omega$, $(30-j40)\ \Omega$ and $(80+j60)\ \Omega$ are connected in delta to a 3 phase, 200 V supply. Find the phase currents, line currents and total power absorbed.
5. a) Define cycle, Time period, angular velocity, frequency, average and rms value of an alternating quantity.
- b) A series circuit consists of resistance equal to $4\ \Omega$ and inductance of 0.01 H. The applied voltage is $283 \sin(300t + 90^\circ)\text{V}$. Calculate the following:
- Power factor
 - Expression for $i(t)$
 - The power dissipated in the circuit
 - Voltage drop across each elements
 - Draw a phasor diagram

[8]

[8]

[8]

[6]

[10]
