(iii) The frequency of induced EMF in rotor

(iv) Speed of rotor mmf relative to rotor winding.

(c) Write short notes on the following : (CO4)

(i) Batteries

(ii) DC motor

(iii) Induction motor

(iv) Types of Switches.

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TEE–201

## B. TECH. (SECOND SEMESTER) END SEMESTER EXAMINATION, June, 2023

BASIC ELECTRICAL ENGINEERING

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

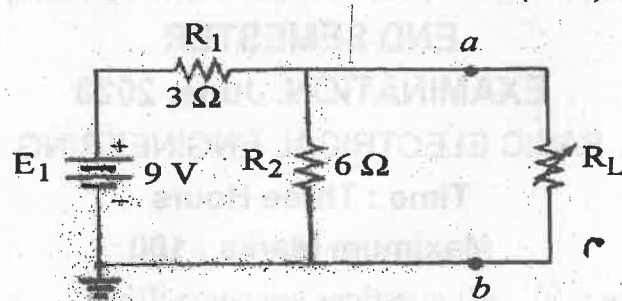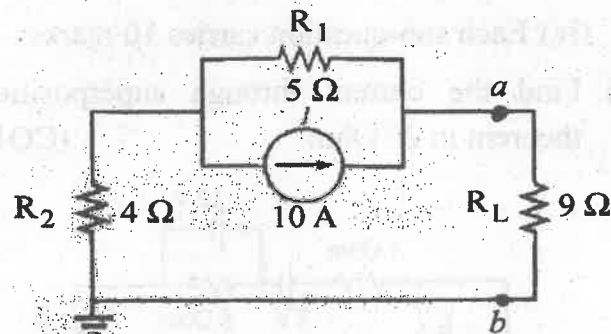1. (a) Find the current through superposition theorem in 20 Ohm.　　　(CO1)

P. T. O.
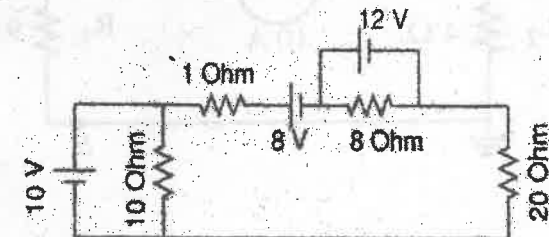
(b) Find the Thevenin equivalent circuit for the network in the shaded area of the network given. Then find the current through R_L, for value of 2, 10 and 100 Ohm.　　　(CO1)
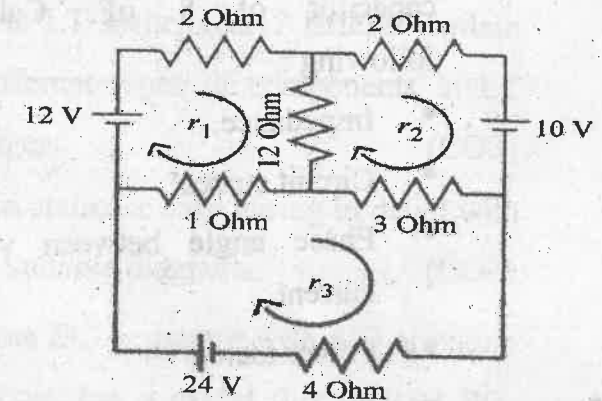

(c) Find the Norton equivalent circuit for the loaf resistance of 9-Ohm in Fig.　　(CO1)

2. (a) By using Kirchhoff's voltage law (KVL)/Mesh analysis find the current flowing through a 4 Ω resistor.　(CO2)

(b) Find the impedance of a series RLC circuit if the inductive reactance, capacitive reactance, and resistance are 184 Ω, 144 Ω and 30 Ω respectively. Also calculate the phase angle between voltage and current.　(CO2)

(c) Define the following :　(CO2)

* Q-factor
* Resonance in series R-L-C circuit
* RMS and Average values
* Form factor and Peak factor

3. (a) A 240 V, 50 Hz AC supply is applied to a coil of 0.08 H inductance and 4 Ω resistance connected in series with a capacitor of 8 µF. Calculate the following : (CO2)

* Impedance,

* Circuit current,

* Phase angle between voltage and current,

* Power factor,

* Power consumed,

* Q-factor of the circuit at resonant frequency.

(b) A resistor R in series with a capacitor C is connected to a 50 Hz, 240 V supply. Find the value of C so that R absorbs 300 W at 100 V. Also find the maximum charge and the maximum stored energy in C. (CO2)

(c) The equation for an alternating current is given by $i = 77 \sin 314t$. Find the peak value, frequency, time period and instantaneous value at $t = 2$ ms. (CO2)

4. (a) Explain MCCB with a suitable diagram. Also write the main differences between MCB and MCCB. (CO3)

(b) What is LT switchgear ? Briefly explain the different types of components in LT switchgear. (CO3)

(c) Explain staircase case wiring in detail with all the suitable diagrams. (CO3)

5. (a) A 4 pole DC generator with 400 armature conductors has a useful flux of 0.04 Wb. What is the emf induced if the machine is wave wound and runs at 1200 rpm ? What must be the speed at which the machine should be driven to generate the same emf if the machine is lap wound. (CO4)

(b) A three phase 50 Hz, 6-pole induction motor is running with a slip of 3%. Calculate : (CO4)

(i) The speed of the rotating field

(ii) The motor speed

P. T. O.