SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai

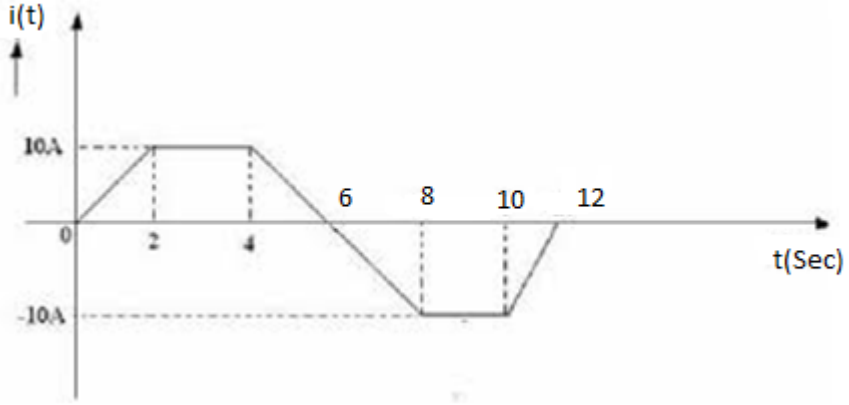
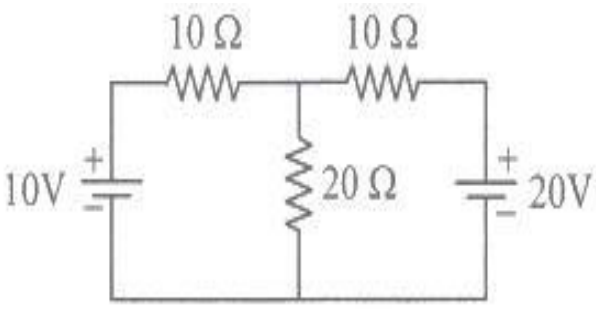
First Semester

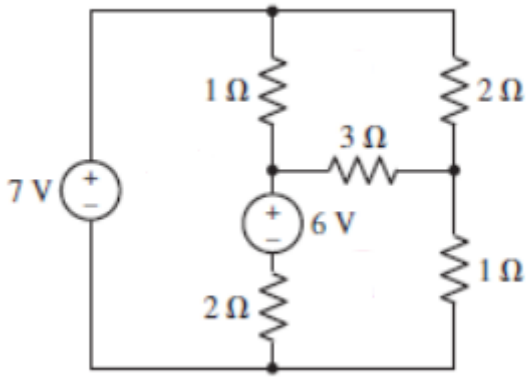
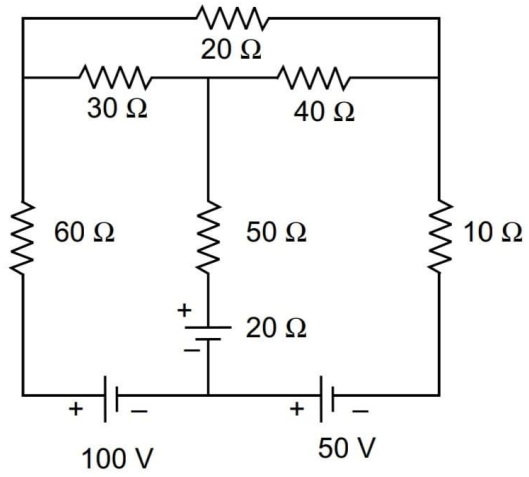
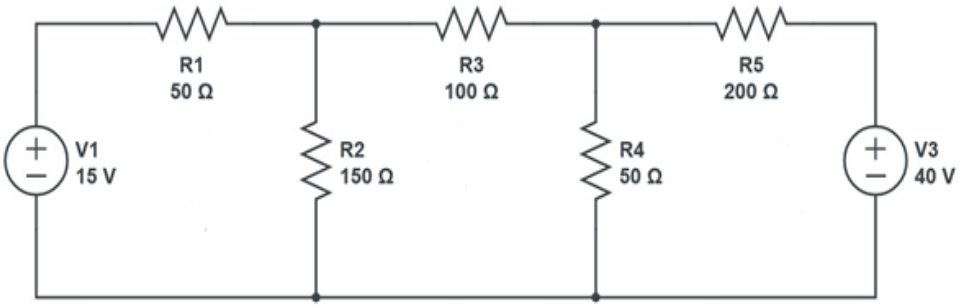
B.E-Mechanical and Mechatronics Engineering (Additive Manufacturing)

23EET101 – Basics of Electrical and Electronics Engineering

Regulations 2023

QUESTION BANK FOR IAE 1

	PART A
1	State the limitations of ohms law.
2	State Kirchhoff's Voltage Law.
3	List the essential requirements (torque) of an instrument.
4	State Kirchhoff's Current Law.
5	Define Ohm's Law.
6	Find the average value of current for the given waveform. 
7	Give the application of DC Motor.
8	Differentiate between separately excited DC Generator and self-excited DC generator.
9	Write down the EMF equation of a DC generator.
10	List the functions of commutator.
	PART B
1	With a suitable sketch explain the principle of operation of attraction type and repulsion type of moving iron instruments.
2	(i) Apply KCL, find Node Voltage V_A for the fig.  (ii) 20 Lamps each of 60 watts are used each for 4 hours per day in a building. Calculate (i) the current drawn when all the lamps are working and (ii) the monthly electricity charge at Rs.2.50/- per unit. Assume a supply of 240 V.

3	Illustrate the mesh currents and also the current through 3 Ω resistance in the circuit shown in fig. 
4	A coil of resistance 5 Ω and inductance 100 mH is connected in series with a 200 μF capacitor across a 220 V, 50 Hz supply. Calculate (i) The inductive reactance (ii) Capacitive reactance (iii) Impedance (iv) Current (v) Power factor (vi) Total power (vii) Voltage across the coil and Capacitor.
5	Discuss the principle of operation of permanent magnet moving coil instruments with neat sketches.
6	With a neat schematic diagram explain the operation of single phase energy meter.
7	Calculate the current in the 50 Ω resistor in the network shown in fig using mesh analysis. 
8	Apply KCL, determine Node voltages V_1 and V_2 for the fig. 
9	Elaborate the constructional details and working principle of DC Generator with a neat sketch also lists its applications.
10	(i) A 50 KW, 250 V Shunt generator operates on full load at 1500 rpm. The armature has 6 poles and is lap wound with 200 turns. Find the induced EMF and the flux per pole at full load. Given that the armature and field resistances are 0.01 Ω 125 Ω respectively. Neglect armature reaction.

	(ii) Obtain the mathematical expression for generated EMF of DC Generator and explain each term.
11	Elaborate the construction and operation of rotating device, which convert electrical energy to mechanical energy.
12	(i) A wave connected armature winding has 19 slots with 54 conductors per slot. If the flux per pole is 0.025wb and number of poles is 8, find the speed at which the generator should be run to give 513V. Also find the speed if the armature is lap connected. (ii) Determine the current delivered by the source in the circuit shown below