Basic Electronics
Assignment Number 02
Total Marks 60

This assignment is including three CLOs.

| CLO#	Course Learning Outcome (CLO)	Taxonomy Level	Mapping to PLO
CLO 1	Students will be able to **understand** the basic knowledge of electrical & electronic components, number systems and Boolean algebra.	C2	2
CLO 2	The students will be able to Analyze basic resistive circuits, electronic circuits, and combinational logic circuits.	C4	3
CLO 3	The students will be able to Design basic resistive circuits and combinational logic circuits.	C5	4

<u>CLO-1 (20 Marks)</u>

Question 01:-

1. Describe how resistors behave in a parallel configuration.
2. Explain the purpose of using resistors in parallel.
3. Summarize the differences between series and parallel circuits.
4. Describe how changing the value of one resistor affects the overall resistance in a parallel circuit.
5. Describe how changes in resistor values impact the distribution of current in a parallel circuit.
6. Describe the consequences of adding a new resistor to an existing parallel circuit.

Question 02 :-

1. Explain the concept of resistive series-parallel combination circuits.
2. Interpret the voltage distribution across resistors in a series-parallel circuit.
3. Summarize the effects of adding resistors in parallel to an existing series circuit.
4. Compare the voltage drops across resistors in series versus those in parallel.
5. Discuss the implications of changing resistor values within a series-parallel configuration.
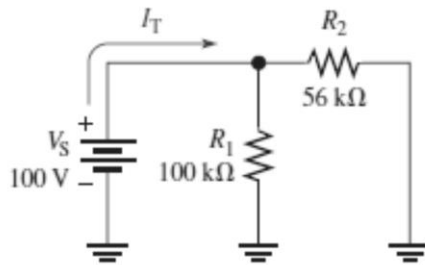6. Distinguish the role of each resistor in a given series-parallel combination.
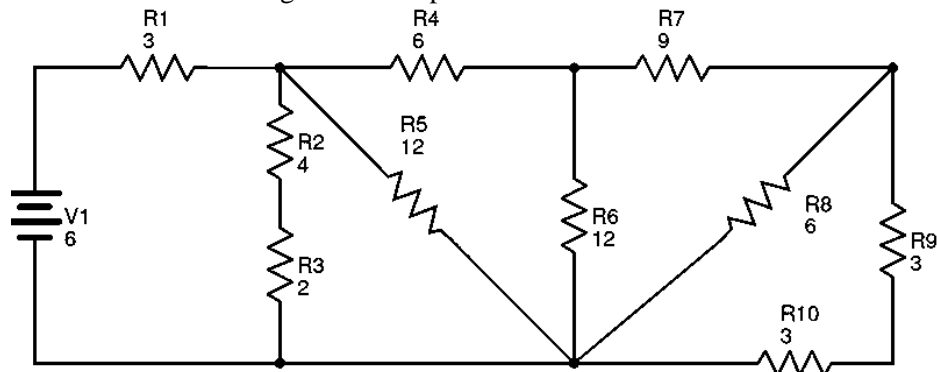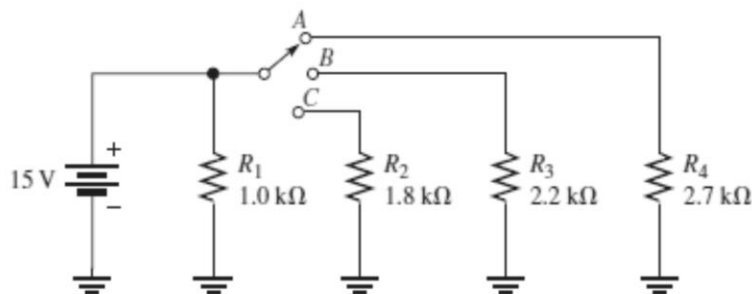
CLO-2 (20 Marks)

Question 03:-

1. Calculate the total resistance connected to the voltage source of the circuit in Figure below.
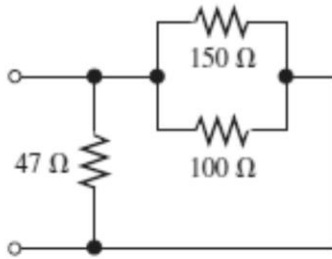

2. Calculate the total current produced by the battery in Figure below.

3. Calculate the total current from the voltage source in Figure 63 for each switch position?

4. Four equal-value resistors are connected in parallel. Five volts are applied across the parallel circuit, and 1.11 mA are measured from the source. Calculate the value of each resistor?

5. Calculate the current in each branch by current divider rule.
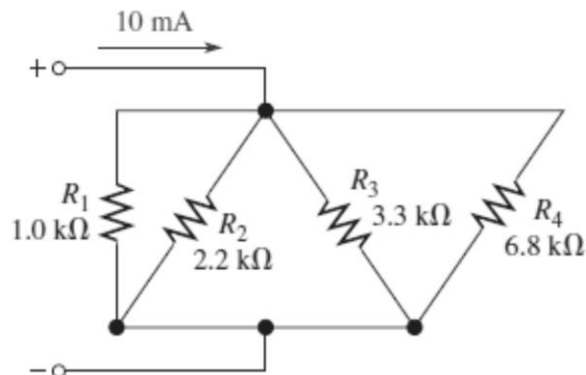
Question 04:-

1. Visualize and draw the diagrams o following series-parallel combinations:

    (a) R1 in series with the parallel combination of R2 and R3
    (b) R1 in parallel with the series combination of R2 and R3
    (c) R1 in parallel with a branch containing R2 in series with a parallel combination of four other resistors

2. Calculate R_T of the given circuit.
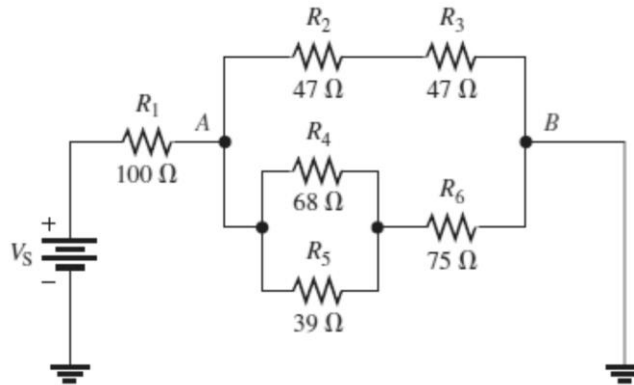
3. Calculate the current through R2 and the current through R3 in the given circuit.
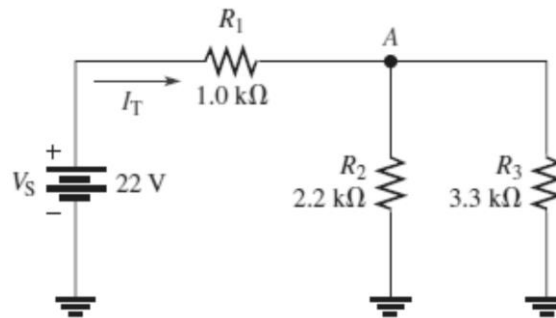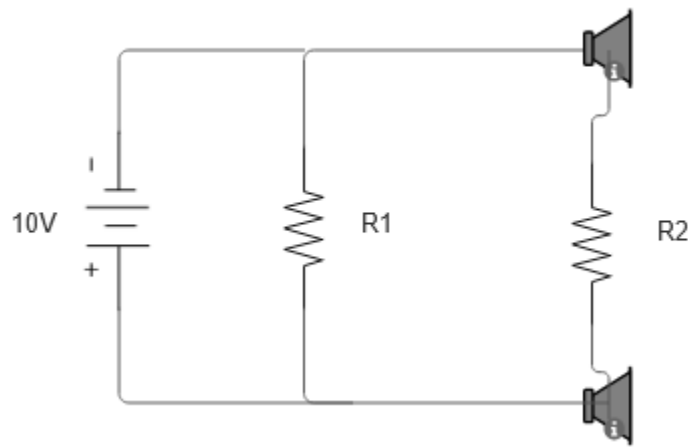

4. Calculate the current through each resistor and the voltage at each labeled node with to ground in the ladder network of Figure
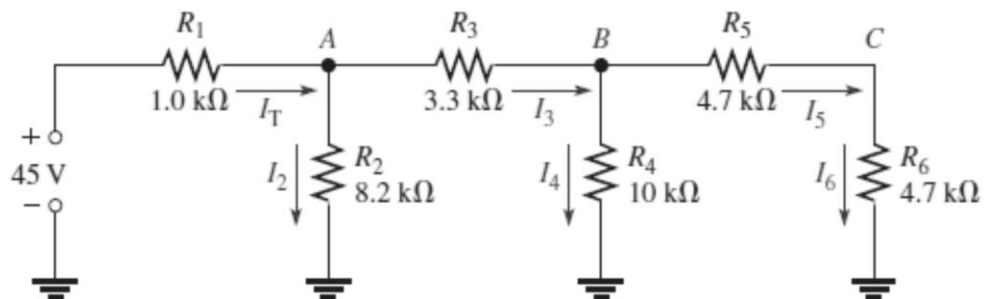
CLO-3 (20 Marks)

Question 05:-

1. Design a power supply system for kitchen appliances such as a microwave, toaster, and blender using parallel circuits to allow independent operation of each device without affecting the others.
2. You have a 12V battery which is facing 150 ohms total resistance from three devices (LED, mobile charger and a USB porta) . Design a circuit which can supply 10mA to an LED, 55mA to a mobile charger and 15mA to a USB port.
3. Design a series-parallel combination circuit for a speaker system with two speakers. Each speaker has an impedance of 8 ohms. If 10 volts battery is applied to the circuit then each branch must get 0.5A of current. Calculate the exact pair of the resistances (R1, R2) to fulfil the conditions.