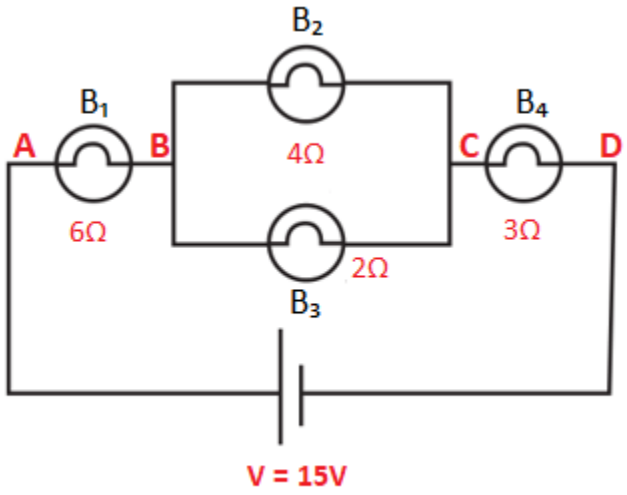
Computer Architecture

Tutorial - Revision

Answer all questions.

Question 01

Four bulbs B1, B2, B3 & B4 are connected to 15V, supply as shown in the following diagram.



1. Calculate the total resistance of the B2 and B3.
2. What is the total resistance between the two points A and D.
3. What is the current gained from the electric supply.
4. Calculate the potential difference between A and B.
5. Calculate the potential difference between B and C.
6. Calculate the potential difference between C and D.
7. Calculate the current flowing through B2 bulb.
8. Calculate the current flowing through B3 bulb.
9. If the B3 bulb is removed, the what would be the current gain from the electric supply.

Question 02

Simplify the following expressions using BOOLEAN ALGEBRA LAWS

I. F = A'.B'.C + (A+B+C)' + A'.B'.C'.D

II. F = A.B.C + A' + A.B'.C

Question 03

Simplify the following given expression using K-maps and construct the logic circuit for the simplified Boolean expression

Fsop = (A.B.C')+(A.B'.C)+(A'.B.C)+(A.B'.C')

Question 04

Consider a computer that is used for simple numerical problems. It uses 10 bits for an opcode, and 27 bits for a memory address.

What is the size of its instruction? _____ bits

How many different instructions can it have? _____

What is the maximum memory size that it can address? _____ (Hint: Assume that 2^20 is about 1M).

Question 05

Explain the half adder and full adder using example.

Question 06

Explain the SR latches using NOR and NAND gates.