Q.1 An inductance L = 0.0637 H and a parallel R = 40 Ω connected across 200 V, 50 Hz ac supply. Calculate: (a) the current drawn from the supply (b) draw the pahsor diagram.

Q.2. Determine the Thevenin's equivalent circuit for the circuit shown in Fig. 1.

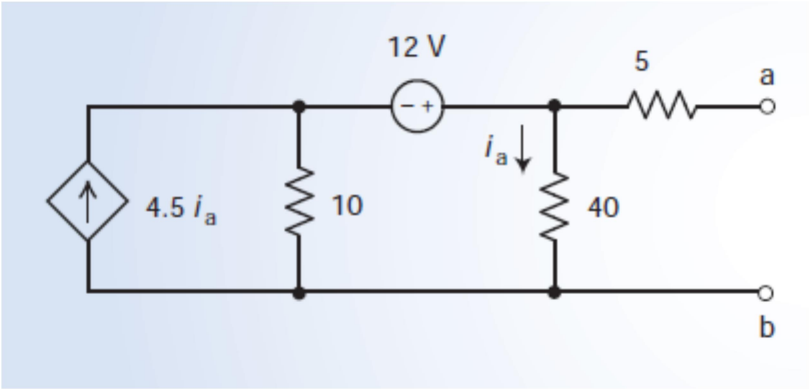


Fig. 1.

Q.3. A half-wave diode rectifier has a forward voltage drop, i.e., voltage drop across the diode when conducting is 0.7 V. The load resistance is 600 Ω. The rms value of the ac input is 28.87 V. Calculate I_{dc}, I_{rms}, and PIV.

Q.4. A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by and one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles of which gate? Explain your answer with truth table of the gate.

Q.5. Draw the circuit diagram using logic gates to add-up two data bits and explain the results with the applied data bits pattern.

Q.6. Determine the current in a resistive load connected between theterminals A and B of the network shown in Fig.2 if the load is (a) 5 Ω (b) 3 Ω. By Thevenin's theorem

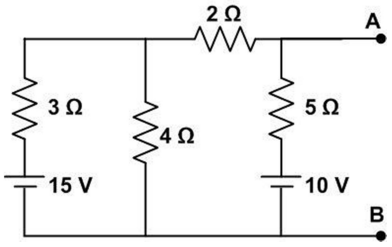
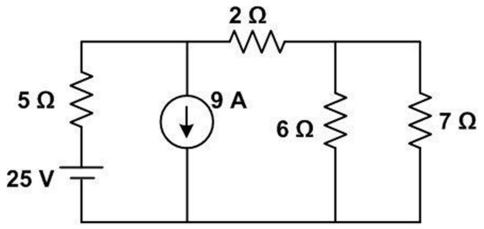


Fig.2

Q.7 Using Norton's theorem, calculate the current flowing through the 7 Ω load resistor in thecircuit of Fig.3



. Fig.3

Q.8. Apply Superposition theorem for finding the voltage drop V acrossthe 5 Ω resistors in the circuit of Fig. 4

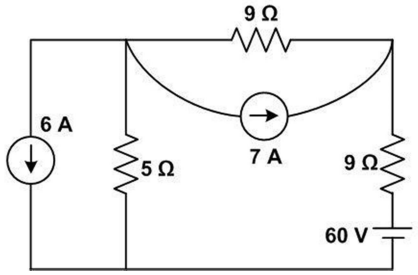


Fig. 4

Q.9. With reference to the network of Fig. 5, by applying Thevenin's theorem finds thefollowing:

i. The Thevenin's equivalent voltage of the network when viewed from terminals A and B.
ii. The equivalent resistance of the network when looked into from terminals A and B
iii. Current in the load resistance R_L of 2 Ω

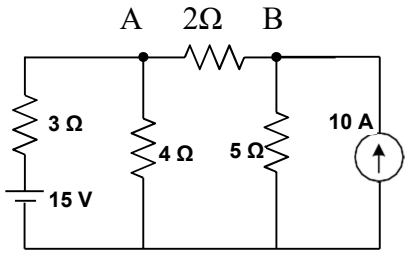


Fig. 5

Q.10. A variable iron-core inductor, a resistor, and a capacitor are connected in series across a 230 V, 50 Hz supply. The maximum current of 1.5 A was obtained in the circuit by changing the inductance of the coil at resonance. At that time the voltage across the capacitor was measured as 600 V. Determine the value of R, L and C.

Q.11. A 5.0V stabilised power supply is required to be produced from a 12V DC power supply input source. The maximum power rating P_Z of the zener diode is 2W. Draw the zener regulator circuit and find the values of:

a). The maximum current flowing through the zener diode.

b). The minimum value of the series resistor, R_S.

c). The load current I_L if a load resistor of 1kΩ is connected.

d). The zener current I_Z at full load.

Q.12. Define α, β, and γ for a BJT? Derive the relation between them.

Q13. Implement FA using 3 to 8 Decoder

Q.14. Implement the BCD to 7 Segement Decoder

Q.15. An 8x1 multiplexer has inputs A , B , and C connected to the selection inputs $S2$, $S1$, and $S0$, respectively. The data inputs I_0 through I_7 are as follows:
(a) $I1 = I2 = I7 = 0$; $I3 = I5 = 1$; $I0 = I4 = D$; and $I6 = D'$.
(b) $I1 = I2 = 0$; $I3 = I7 = 1$; $I4 = I5 = D$; and $I0 = I6 = D'$.
Determine the Boolean function that the multiplexer implements.