Boumerdes University
Faculty of Technology
Department of Electrical Systems Engineering
Speciality: Electronic-S4-
Module : Fundamental Electronic

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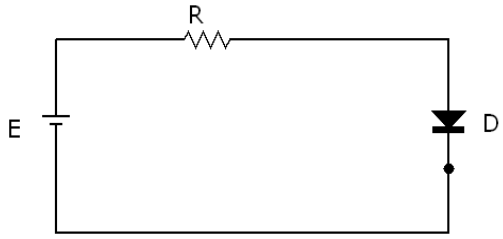
Recitation 1 : PN Junction Diode

Exercise 1

For the following circuit, calculate R value.

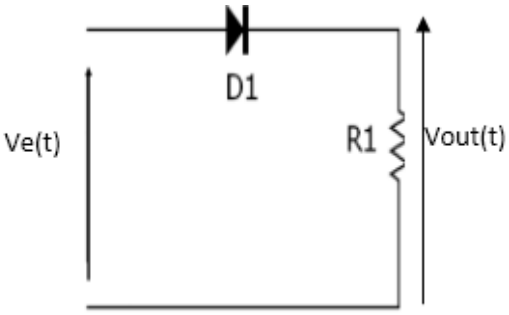
Given: V0=0.62V, E=2V, and I=100mA.



Exercise 2

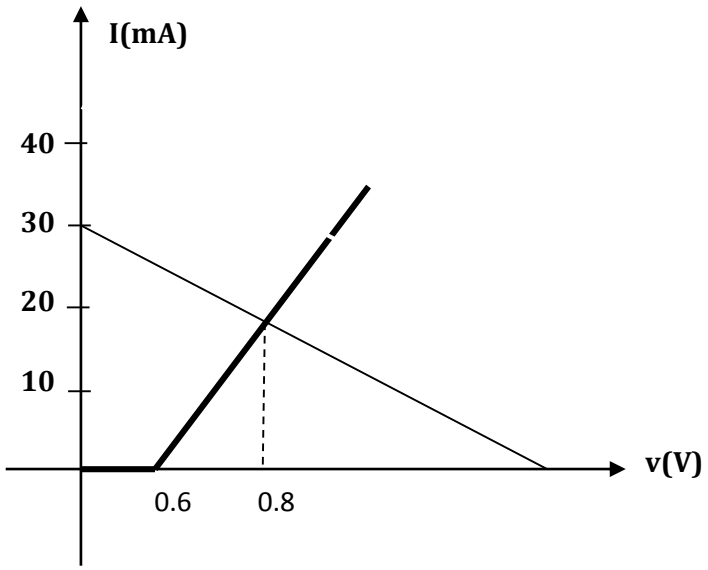
For the following circuit, draw the voltage Vs for $v_m = 10V$; 1V and 0.3V.

Given: R=1000 Ω; V0=**0.7V;** $\boldsymbol{v(t) = v_m sinwt}$

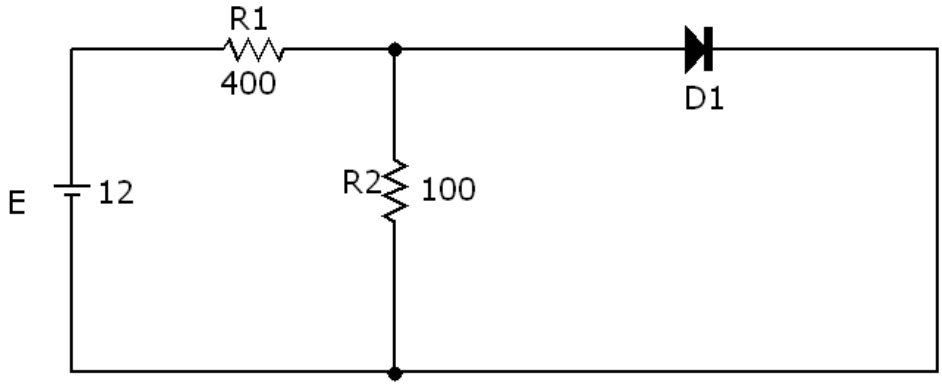


Exercise 3

Let D a PN junction diode, its characteristic can be approximated by the figure below.



The diode "D" is used in the circuit given in the figure below.

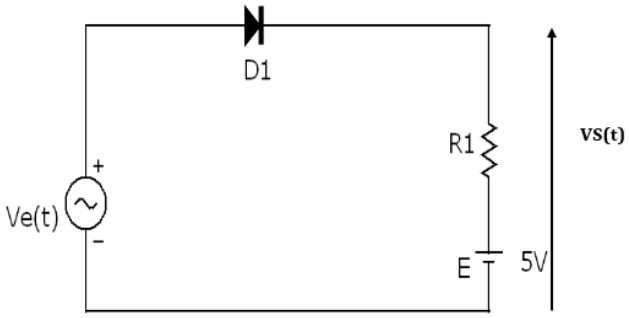


1. Write the diode load line equation.

2. Determine the operating point graphically Q.

Exercise 4

In the following circuit, the diode is perfect (ideal), draw the graphs Ve(t) and VS(t). Given Ve(t)=12sinwt



Exercise 5

Consider the circuit in the figure below. Trace the shape of the signal Vs when Ve(t) has the form shown in figure 2:

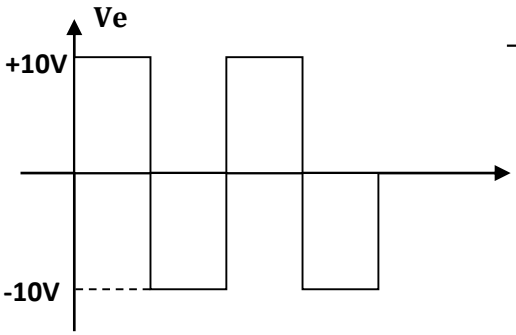


Figure 1

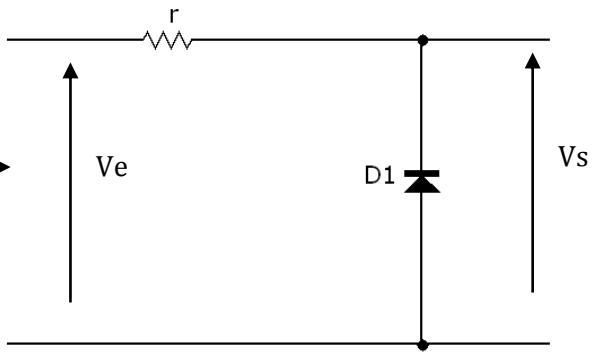
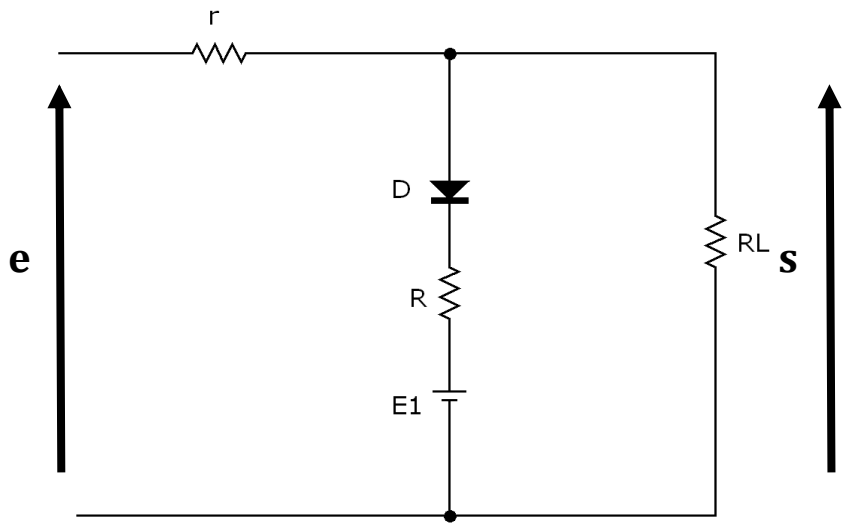


Figure 2

Exercice 6

We consider circuit given in the Figure below in which diode D has a zero threshold voltage and a negligible dynamic resistance.

Given: r=100Ω, RL=1K Ω, R=250 Ω, E1=3V.



1. We consider the diode D is blocked

    1.1. Give the equivalent diagram of the circuit

    1.2. Determine a relationship between r, e, s and RL then give the numerical expression of s as a function of e.

2. We consider the diode D is passed

    2.1. Give the equivalent diagram of the circuit

    2.2. Determine a relationship between r, e, s, E1, RL and R of s as a function of e.