Handwritten Assignments 4

Question 1:

The 6.8-v zener diode in the circuit of fig. 1 (a) is specified to have V_Z=6.8V at I_Z=5mA, r_z=20Ω, and I_{ZK}=0.2mA. The supply voltage V^+ is nominally 10V but can vary by ±1V. Find V_O with no load and with V^+ at its nominal value.

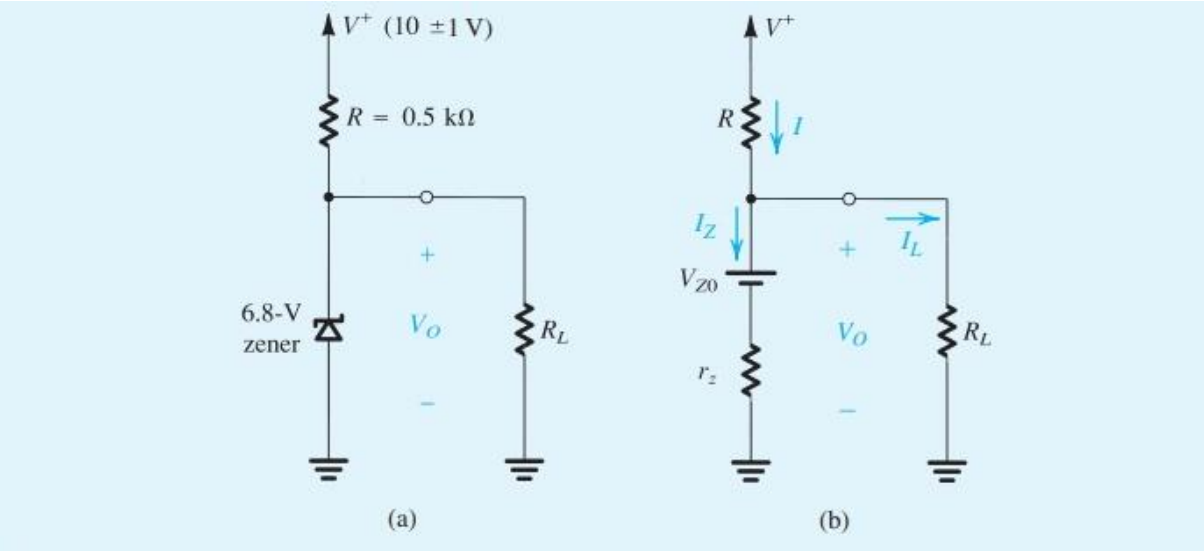

Fig1.

Question 2:

Consider the circuit shown in fig2. For the case in which R=10KΩ. The power supply V^+ has a dc value of 10V on which is superimposed a 60-Hz sinusoid of 1-V peak amplitude. (This "signal" component of the power-supply voltage is an imperfection in the power-supply design. It is known as the power-supply ripple, more on this later.) Calculate both the dc voltage of the diode and the amplitude of the sine-wave signal appearing across it. Assume the diode to have a 0.7-V drop at 1-mA current.

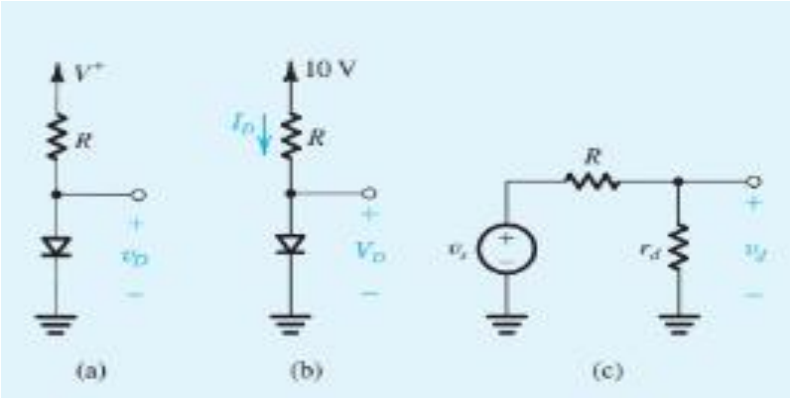

Fig2.

Question 3:

Determine the current I_D and the diode voltage V_D for the circuit in fig.3 with V_{DD}=5V and R=1KΩ, Assume that the diode has a current of 1mA at a voltage of 0.7V.

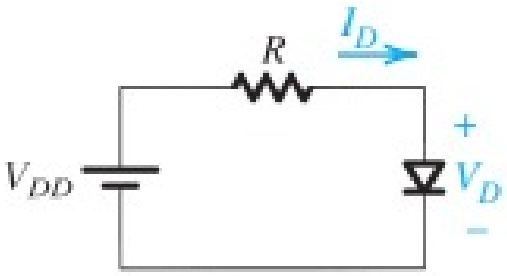

fig.3