402058 – Electronic Circuit Design 1 – Fall 2016

Quiz 1

(08/16/2016)

Student Name: _____ Student No. _____

Honor Code Statement: *I have neither given nor received help on this quiz*. Signature: _____

1. Write the expression of i_1 in terms of I_{in}: _____

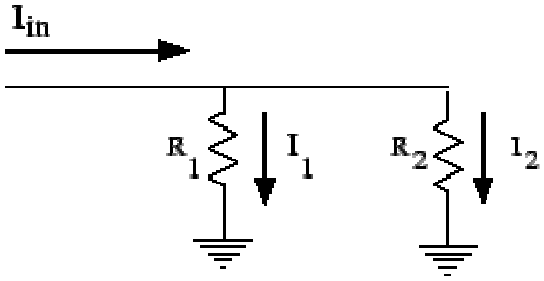


Fig. 1

2. Write the expression of v_{out} in terms of v_{in}: _____

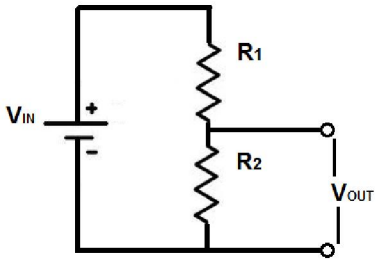


Fig. 2

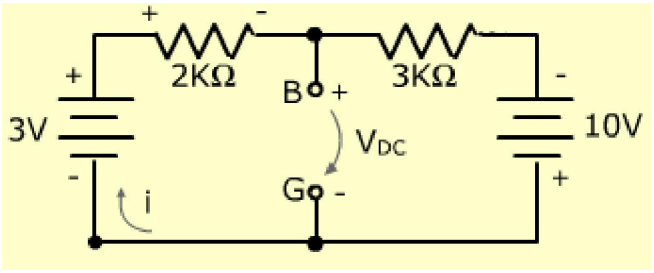
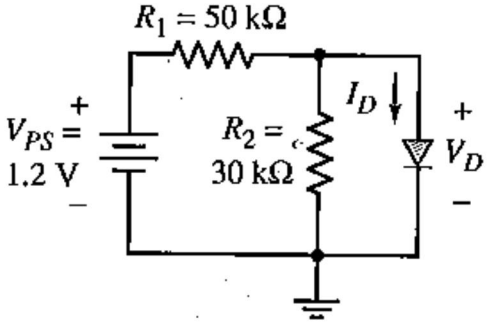


Fig. 3

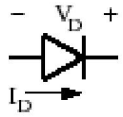
3. Find the Thevenin equivalent circuit of the circuit in Fig. 3 (seen from B-G):

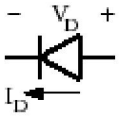
V_{TH} = _____, R_{TH} = _____

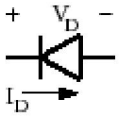
4. What is I_D is the circuit shown below, assume V_{on}=0.7V? _____

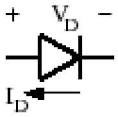


5. Which figure above shows the correct sign convention for both positive diode voltage and positive diode current? _____

a) 

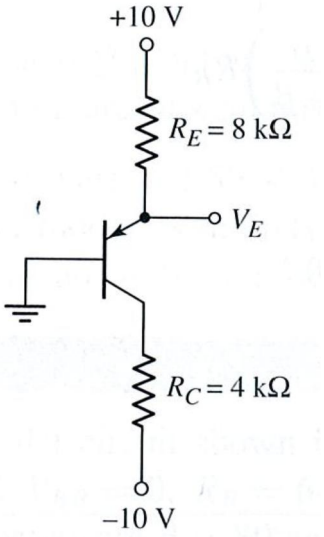
b) 

c) 

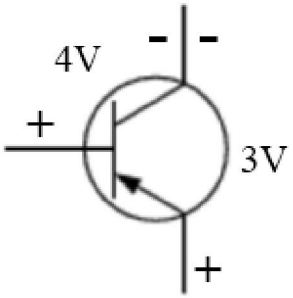
d) 

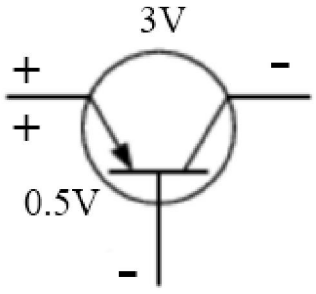
e) None of these

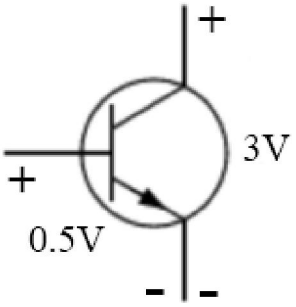
6. What is the V_{EC} in the circuit shown below, assume β=85, $I_s=10^{-14}$A, V_{EB}(ON)=0.7V, and V_T=25mV?
V_{EC} = _____



7. For each of the three transistors shown below, identify the region of operation (Cutoff, Forward Active, Reverse Active or Saturation) from the list of possible answers given below.







_____ _____ _____