Handwritten Assignments 7

Question 1:

Design the circuit of Fig. 1 to establish a drain current of 0.1 mA and a drain voltage of +0.3 V. The MOSFET has Vt =0.5 V, μnCox = 400 μA/V2, L = 0.4 μm, and W = 5 μm. Specify the required values for R_S and R_D.

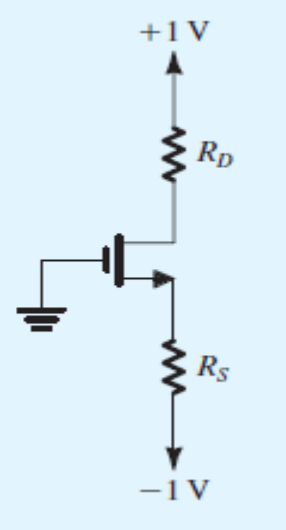

Fig. 1

Question 2:

The PMOS transistor in the circuit of Fig. 2 has Vt = −0.5 V, μpCox = 100 μA/V2, L = 0.18 μm, and λ=0. Find the values required for W and Rin order to establish a drain current of 180 μA and a voltage VD of 1 V.

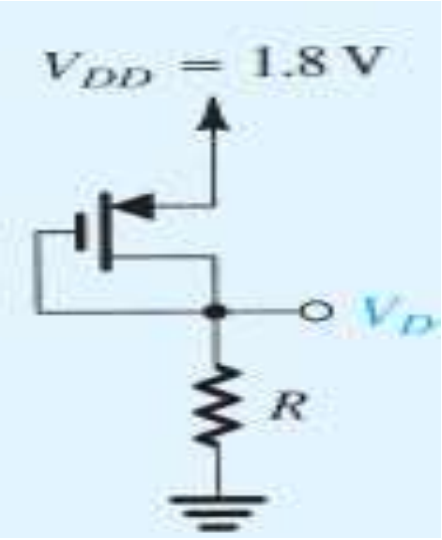

Fig. 2

Question 3:

For the circuits shown in Fig. 3, find the labeled node voltages. The NMOS transistors have V_t = 0.9 V and $K_n'(W/L)$ = 1.5 mA/V^2.

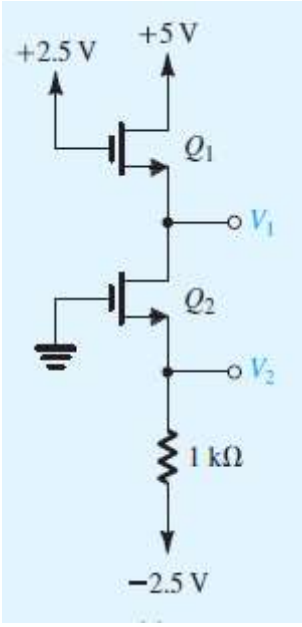

Fig. 3