Name **Roll No.** **Tutorial Section**

Department of Electronics and Electrical Engineering
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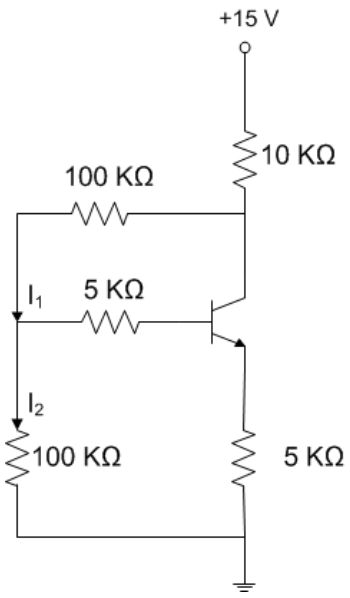
EE101 Quiz#1 Problems

1. Consider the biasing circuit shown in the Fig. 1 where the transistor used has β=20 when working in the active region and $V_{CE,sat}$=0.1 V when it is in saturation.



(a) Give a logical argument (*No calculations!)* why the transistor cannot be in saturation. **[1]**

(b) Assuming that the transistor is working in the active region, calculate its bias point (i.e. V_{CE}, I_C, and I_B) **[3]**

(c) Confirm that the transistor is indeed in active region as assumed in part (b). **[1]**

2.

(a) The readings on the voltmeter and the ammeter (assumed ideal) were 14.4 V and 3.2 A respectively, when they were connected separately across terminals *a* and *b* of the linear network shown in Fig 2 (a). Draw the Thevenin's equivalent circuit and the Norton's equivalent circuit for the network showing the values of all necessary parameters. **[1]**

(b) Write and solve the mesh equations for the circuit shown in Fig.ure 2(b) and calculate the total current through the 3 Ω resistor. **[2]**

(c) Verify the result of Q 2(b) using nodal anslysis. Take node 4 as the reference. **[2]**

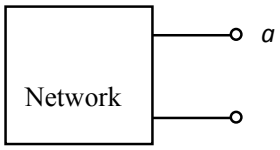


Fig. 2 (a)

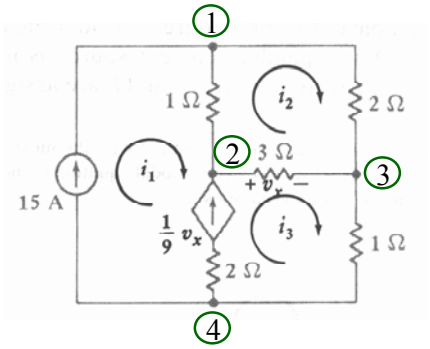


Fig. 2 (b)