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## VE311 Electronic Circuit Homework 4

Due: **June 18th 11:59a.m.**

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*Note:*

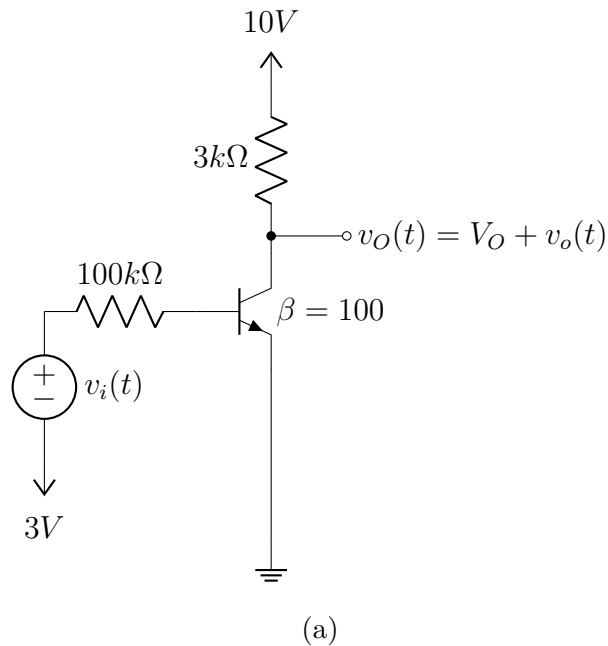
- 1) *Please use A4 size paper or page.*
- 2) *Please clearly state out your final result for each question.*
- 3) *Please attach the screenshot of Pspice simulation result if necessary.*

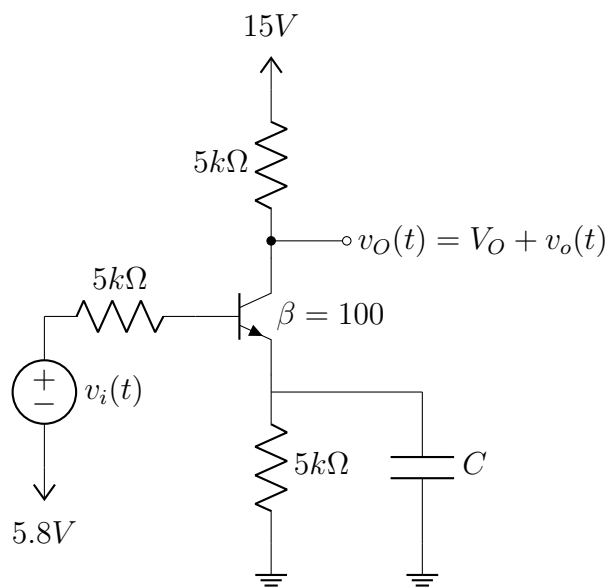
Red Tiger Technologies excels in BJT technology for integrated circuits. To outshine them, Blue Tiger's boss, Xuyang, sends spy Yiyang to infiltrate Red Tiger. Yiyang uncovers three unresolved BJT problems of Red Tiger. Xuyang assigns his engineers the task of solving these critical issues, aiming to secure Blue Tiger's dominance.

### Question 1. Small Signal Analysis of BJT

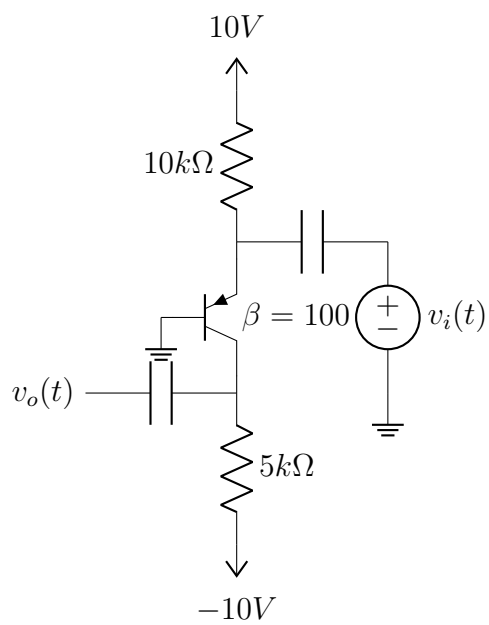
Consider the following BJT amplifiers, determine their small-signal, open-circuit voltage gain  $A_v = \frac{v_o(t)}{v_i(t)}$  respectively. Neglect the Early effect. Hint: Try to follow the steps to solve each question

- 1) Complete a D.C. Analysis.
- 2) Calculate the small-signal circuit parameters for each BJT.
- 3) Carefully replace all BJTs with their small-signal circuit model.
- 4) Set all D.C. sources to zero.
- 5) Analyze small-signal circuit.





(b)



(c)