

EE 2301 Basic Electronic Circuit
2010-2011 Semester A
Pre-Quiz Assignment 3

Instructions:

1. Please submit a softcopy and a hardcopy of your assignment. No mark will be given if any one of it is missing.
2. The softcopy should be submitted through BB before **15 Nov 2010 11:55pm** (Monday) which is the official deadline of this assignment. 25% of your score will be deducted for late submission.
3. The hardcopy should then be submitted to your class tutor during the tutorial class of **Week 12**.
4. You are not required to type your working in word document. Instead, you can scan your hardcopy in pdf or words format for softcopy submission.
5. Plagiarism is a serious misconduct according to University Code of Conduct. The most severe penalty may lead to a termination of study. Please note that the one who copy or allow other to copy may face the same penalty.

Attempt all the questions (total 50 marks)

1. For the circuit shown in Figure 1, determine the equivalent impedance, Z_{eq} , seen by the source which is equal to $v_s(t) = 100\cos\left(3000t + \frac{\pi}{12}\right)$ V. If the source frequency is now varied, what is the frequency at which the Z_{eq} becomes purely resistive?

(15 marks)

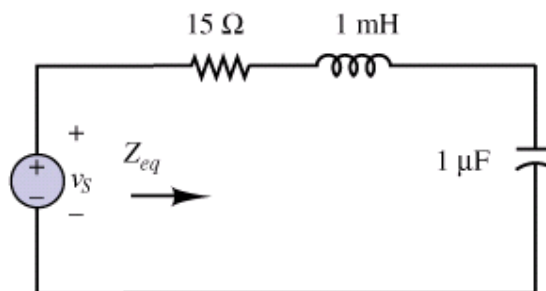


Figure 1

2. For the circuit shown in Figure 2, identify which types of op-amp configurations (inverting, non-inverting, difference, summing) are represented for the op-amps A1, A2, A3 and A4.

Express v_o in terms of v_1 and v_2 . Assuming all the op-amps are ideal, identify and comment which resistor(s) in Figure 2 have no effect on the overall gain of the circuit. Modify the circuit by changing the resistor(s) values so that $v_o = v_1 - v_2$.

(20 marks)

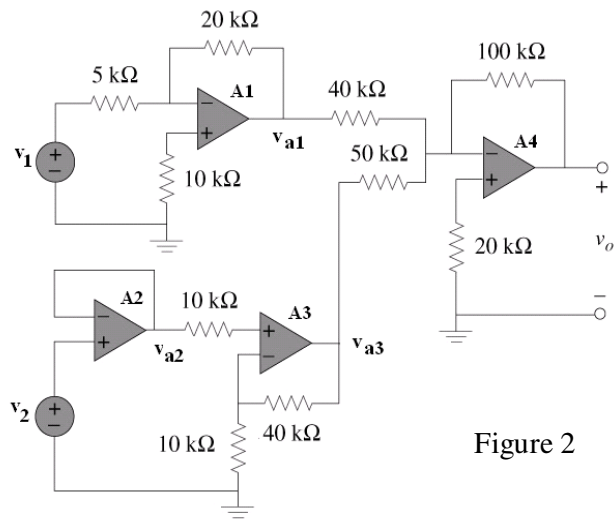


Figure 2

3. For the circuit shown in Figure 3, use the **offset diode model** to determine whether the diode is conducting or not. Hence determine the power generated by the 10V source. Assume that the turn on voltage of the diode is 0.6V.

(15 marks)

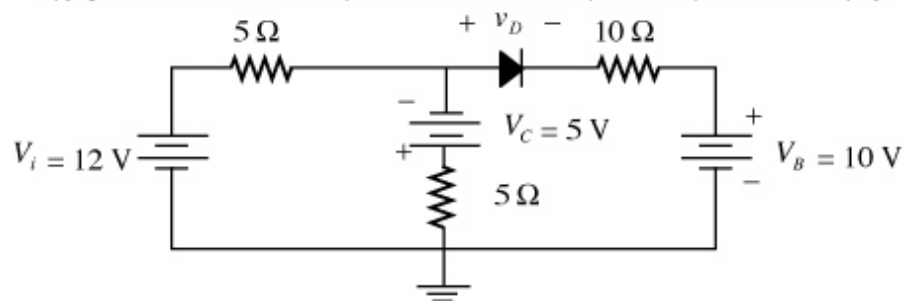


Figure 3

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