NAME	
ID#	

ECSE 330

INTRODUCTION TO ELECTRONICS

(Winter 2008)

Quiz 1 Set B

Tuesday January 29, 2008

Time Allowed: 45 Minutes

Total Marks: 20 Marks

Instructions:

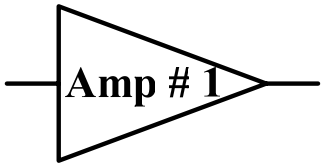
- Answer all questions on the question sheets provided.
- Show all your work to receive full credits.
- Feel free to request additional blank paper if needed.

Question	Marks
Q1	/ 14
Q2	/ 6
Total	/ 20

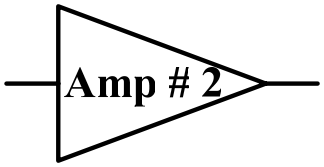
Question 1)

(a) Sketch the circuit model of a voltage amplifier, clearly label all components. (1 pt)

(b) What is the best way to connect two voltage amplifiers shown below between a 100 KΩ source and a 100Ω load in order to achieve maximum voltage gain? (2 pt)



Input resistance = 2K Ω
Output resistance = 100 Ω
Open circuit voltage gain = 80



Input resistance = 1M Ω
Output resistance = 1K Ω
Open circuit voltage gain = 100

(c) What is the overall voltage gain of the system based on your choice in part (b). (4 pt)

(d) The circuit in part (b) is now modified by connecting a 5nF capacitor between the output of the first stage and the input of the second stage:

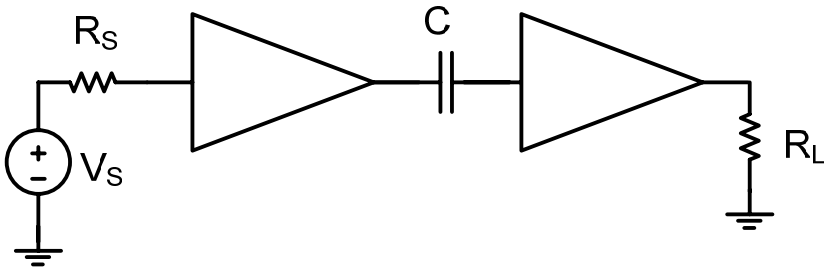
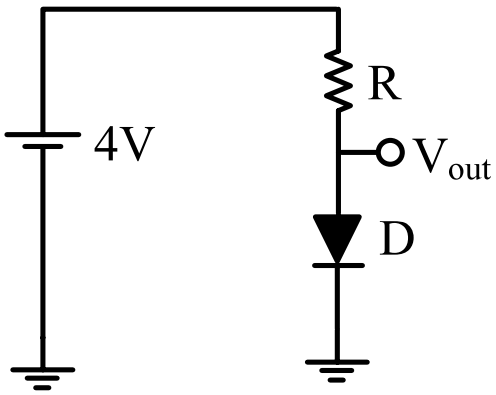


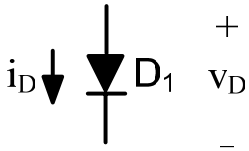
Figure 1

I) Does the amplifier in Figure 1 have lowpass or highpass characteristics? (2 pt)
II) Find the cutoff frequency of the amplifier in Figure 1. (4 pt)
III) Draw the bode magnitude plot of (V_{out}/V_S) for the amplifier in Figure 1. (1 pt)

Question 2) In the following circuit the diode has n=2 and conducts i_D=2 mA at v_D=0.75V. Design R such that V_{out}=0.7V. Use exponential model for the diode and consider the diode to be in strong forward bias region. (6 pt)



DIODES:



$$i_D = I_S(e^{\frac{v_D}{nV_T}} - 1)$$