For all calculations, show your work neatly on a separate page. Turn in your scratch paper with your exam.

1. On the amplifier schematic provided, indicate the node(s) you would use to measure Q point. (2 points)

2. Calculate the Gain for each stage. (5 points ea)

Input Stage Gain =_____

Output Stage Gain =_____

3. What is the total gain for the whole amplifier? (5 points)

A =_____

4. What DC Voltage value would you expect to see at the base of Q1? (5 points)

V_B =_____

5. What DC Voltage value would you expect to see at the collector of Q1? (5 points)

V_C =_____

6. What DC Voltage value would you expect to see at the emitter of Q1? (5 points)

V_E =_____

7. What DC Voltage value would you expect to see at the base of Q2? (5 points)

V_B =_____

8. What DC Voltage value would you expect to see at the collector of Q2? (5 points)

V_C =_____

9. What DC Voltage value would you expect to see at the emitter of Q2? (5 points)

V_E =_____

10. Calculate the input impedance of the amplifier. (5 points)

Z_{in} =_____

For questions on this page refer to schematic 2 (Draft 6)

11. What DC Voltage value would you expect to see at the following nodes? (2 points each)

$V_{AA} =$ _____

$V_{BB} =$ _____

$V_{CC} =$ _____

$V_{DD} =$ _____

$V_{EE} =$ _____

$V_{FF} =$ _____

12. Calculate the current through each of the resistors. (2 points each)

$I_{R1} =$ _____

$I_{R2} =$ _____

$I_{R3} =$ _____

$I_{R4} =$ _____

$I_{R5} =$ _____

$I_{R6} =$ _____

13. Calculate the total current through both of the voltage sources. (2 points)

$I_{V1} + I_{V2} =$ _____

14. Refer back to the amplifier schematic. What is the total DC current draw for the amplifier? (10 points)

$$I_{Total} = \underline{\hspace{3cm}}$$

15. If the capacitors C3 and C5 were made smaller, would that affect the gain at low frequencies? (explain your answer well for 10 points)

16. Explain the purpose of capacitors C1, C2, and C4. (5 points)

17. Neatly draw a linear power supply with a 120VAC @60Hz 10:1 transformer, full wave bridge rectifier, 100µF polarized capacitor, and a 25Ω load. (5 points)

18. What is the DC output voltage for your power supply? (5 points)

$$V_{OUT} = \underline{\hspace{3cm}}$$

19. What is the peak to peak ripple voltage for your power supply? (5 points)

$$V_{p-p} = \underline{\hspace{3cm}}$$

20. According to the Pocket Reference, the capacity of a typical AA alkaline battery (IEC no. LR6) is. (5 points)

$$mAh = \underline{\hspace{3cm}}$$