1) For the common-emitter configuration shown below where,
\( r_o = \text{infinity and } \beta = 160 \):

a) Determine \( r_e \).
b) Find \( Z_i \).
c) Find \( Z_o \).
d) Calculate \( A_v \).
Zi is about 6000 from Vin peak and Iin peak.
Zo is 5k

re = 26mv/IE

Eth = 3.89 V
Rth = 8.11K
IB = 4.66 uA
IE = 750.1 uA

re = 34.62 ohms
Zi = 25K//12K/\[(1+B)(re + 200)] = 6.67 K
Av = -RL/(re + 200) = -21.3
2) For the emitter-follower configuration shown below where, 
\( r_o = \infty \) and \( \beta = 160 \):

a) Determine \( r_e \).

b) Find \( Z_i \).

c) Find \( Z_o \).

d) Calculate \( A_v \).
Eth = 6V
Rth = 125K
IB = 0.648uA
IE = 0.104mA
re = 250 ohms

\[ Zi = \frac{Rth}{(1+R)(re + RE)} = 123.1k \]

\[ Zo = \frac{R1//R2 + Bre}{(1+B)} \text{ in parallel with } 50k = \]
3) For a J-FET transistor whose properties are $I_{DSS} = 15\text{mA}$ and $V_p = -6$ volts,

a) Fill in the table

<table>
<thead>
<tr>
<th>$V_{GS}$ volts</th>
<th>$I_D$ ma</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
</tr>
</tbody>
</table>

b) Make a plot of the values in the table; i.e., the gate-source characteristics.

c) Label the Q-point on the plot for $V_{GS} = -4$ volts

d) Make a plot of the drain source characteristics using the 7 values of $V_{GS}$ given in the table.

Scores
1. ______
2. ______
3. ______
Total ______