No late work accepted! Do not turn in this sheet of paper. All work and answers must be done on your own paper. For any problems requiring calculations, all work must be shown and must be readable to receive credit.

**Self-Test Exercises**

Q1 : Self-test 1.1 from SP8

Q2 : Self-test 1.2 from SP11

Q3 : Self-test 1.3 from SP12

Q4 : Calculate the shielding constant for the outer most electron and the effective nuclear charge of Mg from Slater’s rule? from SP16

Q5 : Self-test 1.5 from SP19

Q6 : Self-test 1.6 from SP20

Q7 : Self-test 1.7 from SP22

**End Chapter Exercises**

Q8 – E1.1

Q9 – E1.3

Q10 – E1.6

Q11 – E1.7

Q12 – E1.8

Q13 – E1.10

Q14 – E1.11

Q15 – E1.14

Q16 – E1.18
Q17-E1.23

Further Exercise

Q18- Copy and complete the following table:

<table>
<thead>
<tr>
<th>n</th>
<th>l</th>
<th>m_l</th>
<th>Orbital Designation</th>
<th>Number of orbitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>-2, -1, 0, 1, 2</td>
<td>3p</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>-2, -1, 0, 1, 2</td>
<td>5s</td>
<td>5</td>
</tr>
</tbody>
</table>

Q19-Cathy -1.26

For each of the following atoms, write down the a ground state electron configuration and indicate which electrons are core and which are valence:

(a) Na (b) F (c) N

Q20-Cathy -1.27

Draw energy level diagram to represent the ground state electronic configuration

Q21- Draw pictures of the 5 d orbitals. Label each drawing with the appropriate coordinate axes and the orbital lobes correctly with + and – signs.

Q22-

Fill in gaps in the following table.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>(^{75}\text{As}^{3-})</th>
<th>Protons</th>
<th>Neutrons</th>
<th>Electrons</th>
<th>Net Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>29</td>
<td>34</td>
<td>27</td>
<td>3+</td>
</tr>
</tbody>
</table>

HW 1 - Total 110 points