1. Complete the missing information in the table below:

<table>
<thead>
<tr>
<th>Atomic Symbol</th>
<th>Number of Protons</th>
<th>Number of Neutrons</th>
<th>Number of Electrons</th>
</tr>
</thead>
<tbody>
<tr>
<td>$^{80}$Br$^-$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$^{51}$V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$^{48}$Ba$^{2+}$</td>
<td>48</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>$^{82}$Ba$^{2+}$</td>
<td></td>
<td></td>
<td>82</td>
</tr>
</tbody>
</table>

2. Diagrams below represent various nuclei. For each nucleus A-E, write the atomic symbol and indicate which are isotopes:

3. What is the empirical formula for an oxide of bromine that contains 71.4% bromine?

4. Calculate the percent composition (by mass) of the elements in Cd$_3$(AsO$_4$)$_2$. 
5. Calculate the following quantities:
   a) Number of molecules in 23.5 moles of oxygen.

   b) Number of moles in $3.42 \times 10^{25}$ molecules of $\text{H}_2\text{SO}_4$.

   c) Number of molecules in 12.5 grams of $\text{NH}_3$.

   d) Number of grams in $8.26 \times 10^{22}$ molecules of $\text{N}_2\text{H}_4$.

   e) Number of carbon atoms in 0.655 moles of $\text{C}_6\text{H}_{14}$.

   f) Grams of sodium in 85.6 g of $\text{Na}_2\text{SO}_4$. 
6. A 3.000-g sample of a gaseous compound was found to contain 2.560 g of carbon and 0.440 g of hydrogen.
   a) What is the empirical formula for this compound?
   b) If the molar mass of the compound was found to be 42.08 g/mol, what is the molecular formula for this compound?

7. An iron ore sample contains 65.0% hematite (Fe₂O₃) and 35.0% magnetite (Fe₃O₄). What mass of iron (in grams) does 1.00 kg sample of this ore contain?

8. A sample of 0.600 mole of a metal M reacts completely with excess fluorine to form 46.8 g of MF₂.
   a) How many grams of M are present in this sample of MF₂?
      (Hint: How many moles of fluorine are present in this compound?)
   b) What element is represented by the symbol M?
9. Name the following compounds:

a) \( \text{SrCl}_2 \) __________________

b) \( \text{CF}_4 \) __________________

c) \( (\text{NH}_4)_2\text{CO}_3 \) __________________

d) \( \text{H}_3\text{PO}_4 \) __________________

e) \( \text{SnO}_2 \) __________________

f) \( \text{CuNO}_2 \) __________________

10. Write formula for each of the following compounds:

a) calcium sulfate __________________

b) nickel (II) chloride __________________

c) ammonium chlorate __________________

d) phosphorus triiodide __________________

e) hydrosulfuric acid __________________

f) sodium nitride __________________
Answers:

1. No answers provided

2. \( A = \overset{9}{4} \text{Be} \quad B = \overset{11}{5} \text{B} \quad C = \overset{13}{6} \text{C} \quad D = \overset{10}{5} \text{B} \quad E = \overset{12}{6} \text{C} \)
   B and D are isotopes; C and E are isotopes

3. \( \text{BrO}_2 \)

4. 54.8% Cd; 24.4% As; 20.8% O

5. a) \( 1.41 \times 10^{25} \) molecules
   b) 56.8 mol
   c) \( 4.42 \times 10^{23} \) molecules
   d) 4.40 g
   e) \( 2.37 \times 10^{24} \) atoms
   f) 27.7 g

6. a) \( \text{CH}_2 \)
   b) \( \text{C}_3 \text{H}_6 \)

7. 708 g Fe

8. a) 22.8 g F
   b) calcium

9. No answers provided

10. No answers provided