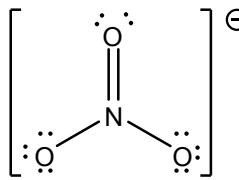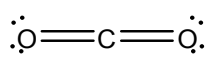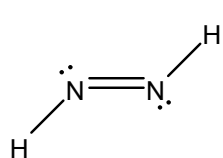|			Marks
			5

- Complete the following table. Give, as required, the formula, the systematic name, the oxidation number of the underlined atom and, where indicated, the number of d electrons for the element in this oxidation state.

FORMULA	SYSTEMATIC NAME	OXIDATION NUMBER	NUMBER OF d ELECTRONS
$\underline{S}O_3$	**sulphur trioxide**	**+VI**	**0**
$K\underline{Mn}O_4$	**potassium permanganate**	**+VII**	**0**
$\underline{Co}Cl_2 \cdot 6H_2O$	**cobalt(II) chloride hexahydrate**	**+II**	**7**
$(NH_4)_2SO_4$	ammonium sulfate		

4

- Draw the Lewis structures, showing all valence electrons for the following species. Indicate which of the species have contributing resonance structures.

NO_3^-	CO_2	N_2H_2
Resonance: **YES** / NO	Resonance: YES / **NO**	Resonance: YES / **NO**

2

- A sample of carboxypeptidase (an enzyme) was purified and found on analysis to contain 0.191% by weight of zinc. What is the *minimum* molecular weight of the enzyme if we assume it is a monomer?

The enzyme must contain at least one zinc atom. If it contains one zinc atom, its contribution to the molar mass is 65.39 amu. If this is 0.191% of the total mass, the molar mass corresponding to 100% is:

0.191 % of molar mass = 65.39

100% of molar mass = 65.39 / 0.00191 = 34240 g mol^{-1}

Answer: **34240 g mol^{-1} or 34.24 kg mol^{-1}**