Marks 9

- Complete the following table. (en = ethylenediamine = $NH_2CH_2CH_2NH_2$)

Formula	$K_2[CoCl_4]$	$Na_3[FeBr(CN)_5]$	$[Zn(en)_2(NO_3)_2]$
Oxidation state of transition metal ion	**+2 (II)**	**+3 (III)**	**+2 (II)**
Coordination number of transition metal ion	**4**	**6**	**6 (4 × N from en and 2 × O from NO_3^-)**
Number of *d*-electrons in the transition metal ion	**7 (Co is in Group 9 so Co^{2+} has 9 – 2= 7)**	**5 (Fe is in Group 8 so Fe^{3+} has 8 – 3 = 5)**	**10 (Zn is in Group 12 Zn^{2+} has 12 – 2= 10)**
Charge of the complex ion	**2– $[CoCl_4]^{2-}$**	**3– $[FeBr(CN)_5]^{3-}$**	**0 $[Zn(en)_2(NO_3)_2]$**
Geometry of the complex ion	**tetrahedral**	**octahedral**	**octahedral**
List all the ligand donor atoms	**4 × Cl**	**1 × Br and 5 × C**	**4 × N and 2 × O**