

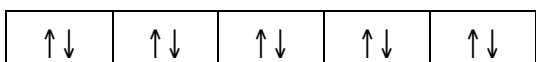
**Marks**  
**6**

- Complete the following table.

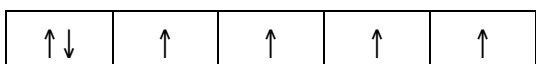
Formula	Geometry of complex	Ligand donor atom(s)
$[\text{Zn}(\text{OH})_4]^{2-}$	<b>tetrahedral</b>	<b>O</b>
$[\text{CoCl}(\text{NH}_3)_5]\text{SO}_4$	<b>octahedral</b>	<b>Cl and N</b>
$\text{K}_4[\text{Fe}(\text{CN})_6]$	<b>octahedral</b>	<b>C</b>
$[\text{Ag}(\text{CN})_2]^-$	<b>linear</b>	<b>C</b>

Select any complex ion from the above table and state whether it is paramagnetic, diamagnetic or neither. Explain your reasoning.

**$\text{Zn}^{2+}$  is  $d^{10}$  system. No unpaired electrons, therefore diamagnetic.**



**$\text{Co}^{3+}$  is  $d^6$  system. 2 paired electrons and 4 unpaired, therefore paramagnetic.**



**$\text{Fe}^{2+}$  is  $d^6$  system. 2 paired electrons and 4 unpaired, therefore paramagnetic.**



**$\text{Ag}^+$  is  $d^{10}$  system. No unpaired electrons, therefore diamagnetic.**

