

# 13.1 Transition Metals

## Question Paper

Course	DPIB Chemistry
Section	13. The Periodic Table- Transition Metals (HL only)
Topic	13.1 Transition Metals
Difficulty	Hard

**Time allowed:** 10  
**Score:** /5  
**Percentage:** /100

### Question 1

Which of the following is the most stable common oxidation state of manganese?

- A.  $\text{Mn}^+$
- B.  $\text{Mn}^{2+}$
- C.  $\text{Mn}^{3+}$
- D.  $\text{Mn}^{4+}$

[1 mark]

### Question 2

Which metal sulfate solution is coloured?

- A.  $\text{ZnSO}_4(\text{aq})$
- B.  $\text{NiSO}_4(\text{aq})$
- C.  $\text{MgSO}_4(\text{aq})$
- D.  $\text{Sc}_2(\text{SO}_4)_3(\text{aq})$

[1 mark]

### Question 3

Which complex has the greatest d orbital splitting?

	Complex	Oxidation state of metal	Colour of complex
A.	$[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$	+3	orange
B.	$[\text{CoCl}_4]^{2-}$	+4	blue
C.	$[\text{Cr}(\text{OH})_6]^{3-}$	+3	green
D.	$[\text{Cr}(\text{NH}_3)_6]^{3+}$	+3	violet

[1 mark]

**Question 4**

Which of the following would be paramagnetic?

- A.  $K^+$
- B.  $Cd^{2+}$
- C.  $Cr^{3+}$
- D.  $Y^{3+}$

[1 mark]

**Question 5**

Copper forms the complex  $[CuCl_4]^{2-}$ . Which statements are correct for this complex?

- I. The complex has a tetrahedral shape
- II. The copper ion has a charge of +2
- III. The copper ion acts as a Lewis base

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

[1 mark]