

JEE MAIN D- AND F-BLOCK ELEMENTS — PREPARATION AND PROPERTIES OF KMnO_4 — PYQS

Max. Marks: 24
Questions: 6

Section A (MCQ) — 5 questions

Q.1 Consider the following statements about manganate and permanganate ions. Identify the **correct** statements.

- A. The geometry of both manganate and permanganate ions is tetrahedral.
- B. The oxidation states of Mn in manganate and permanganate are +7 and +6, respectively.
- C. Oxidation of Mn(II) salt by peroxodisulphate gives manganate ion as the final product.
- D. Manganate ion is paramagnetic and permanganate ion is diamagnetic.
- E. Acidified permanganate ion reduces oxalate, nitrite and iodide ions.

Choose the **correct** answer from the options given below :

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) A and D Only (2) A, B and C Only
(3) A, C and D Only (4) A, D and E Only

Scan or tap for the full solution 

Q.2 "X" is an oxoanion of the lightest element of group 7 (in the periodic table). The metal is in +6 oxidation state in "X". The color of the potassium salt of X is

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) purple (2) orange (3) yellow (4) green

Scan or tap for the full solution 

Q.3 MnO_4^{2-} , in acidic medium, disproportionates to :

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) MnO_4^- and MnO (2) MnO_4^- and MnO_2
(3) Mn_2O_7 and MnO_2 (4) Mn_2O_7 and MnO

Scan or tap for the full solution 

Q.4 Which of the following oxidation reactions are carried out by both $\text{K}_2\text{Cr}_2\text{O}_7$ and KMnO_4 in acidic medium?

- A. $\text{I}^- \rightarrow \text{I}_2$ B. $\text{S}^{2-} \rightarrow \text{S}$
C. $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+}$ D. $\text{I}^- \rightarrow \text{IO}_3^-$
E. $\text{S}_2\text{O}_3^{2-} \rightarrow \text{SO}_4^{2-}$

Choose the correct answer from the options given below :

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) A, B and C Only (2) C, D and E Only
(3) B, C and D Only (4) A, D and E Only

Scan or tap for the full solution 

Q.5 Preparation of potassium permanganate from MnO_2 involves two step process in which the 1st step is a reaction with KOH and KNO_3 to produce

[JEE Main 2025 (Online) 24th January Morning Shift]

- (1) K_3MnO_4 (2) $\text{K}_4[\text{Mn}(\text{OH})_6]$
(3) K_2MnO_4 (4) KMnO_4

Scan or tap for the full solution 

Section B (Numerical) — 1 question

Q.6 KMnO_4 acts as an oxidising agent in acidic medium. 'X' is the difference between the oxidation states of Mn in reactant and product. 'Y' is the number of 'd' electrons present in the brown red precipitate formed at the end of the acetate ion test with neutral ferric chloride. The value of $X + Y$ is _____.

[JEE Main 2025 (Online) 4th April Morning Shift]

Scan or tap for the full solution 

ANSWER KEY

Section A (MCQ) — 5 questions

Ques.	1	2	3	4	5						
Ans.	1	4	2	1	3						

Section B (Numerical) — 1 question

Ques.	6										
Ans.	10										