

JEE MAIN D- AND F-BLOCK ELEMENTS — OXIDES AND OXO-ANIONS OF TRANSITION METALS — PYQS

Max. Marks: 32

Questions: 8

Section A (MCQ) — 6 questions

Q.1 Given below are some of the statements about Mn and Mn_2O_7 . Identify the correct statements.

- A. Mn forms the oxide Mn_2O_7 , in which Mn is in its highest oxidation state.
- B. Oxygen stabilizes the Mn in higher oxidation states by forming multiple bonds with Mn.
- C. Mn_2O_7 is an ionic oxide.
- D. The structure of Mn_2O_7 consists of one bridged oxygen.

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

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

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

Scan or tap for the full solution



Q.2 'X' is the number of acidic oxides among VO_2 , V_2O_3 , CrO_3 , V_2O_5 and Mn_2O_7 . The primary valency of cobalt in $[\text{Co}(\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2)_3](\text{SO}_4)_3$ is Y. The value of $X + Y$ is _____.

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) 3 (2) 4 (3) 2 (4) 5

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Q.3 The amphoteric oxide among V_2O_3 , V_2O_4 and V_2O_5 , upon reaction with alkali leads to formation of an oxide anion. The oxidation state of V in the oxide anion is :

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

- (1) +4 (2) +5 (3) +3 (4) +7

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Q.4 Identify correct statements from below:

- A. The chromate ion is square planar.
- B. Dichromates are generally prepared from chromates.
- C. The green manganate ion is diamagnetic.
- D. Dark green coloured K_2MnO_4 disproportionates in a neutral or acidic medium to give permanganate.
- E. With increasing oxidation number of transition metal, ionic character of the oxides decreases.

Choose the correct answer from the options given below:

[JEE Main 2024 (Online) 31st January Morning Shift]

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

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Q.5 Choose the correct statements from the following
Choose the correct answer from the options given below :

- A. Mn_2O_7 is an oil at room temperature
- B. V_2O_4 reacts with acid to give VO_2^{2+}
- C. CrO is a basic oxide
- D. V_2O_5 does not react with acid

[JEE Main 2024 (Online) 31st January Evening Shift]

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

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Q.6 A and B formed in the following reactions are:
 $\text{CrO}_2\text{Cl}_2 + 4\text{NaOH} \longrightarrow \text{A} + 2\text{NaCl} + 2\text{H}_2\text{O}$,
 $\text{A} + 2\text{HCl} + 2\text{H}_2\text{O}_2 \longrightarrow \text{B} + 3\text{H}_2\text{O}$

[JEE Main 2024 (Online) 30th January Evening Shift]

- (1) $\text{A} = \text{Na}_2\text{Cr}_2\text{O}_7$, $\text{B} = \text{CrO}_5$
(2) $\text{A} = \text{Na}_2\text{CrO}_4$, $\text{B} = \text{CrO}_5$
(3) $\text{A} = \text{Na}_2\text{Cr}_2\text{O}_4$, $\text{B} = \text{CrO}_4$
(4) $\text{A} = \text{Na}_2\text{Cr}_2\text{O}_7$, $\text{B} = \text{CrO}_3$

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Section B (Numerical) — 2 questions

Q.7 Among the following oxides of 3d elements, the number of mixed oxides are _____.

 Ti_2O_3 , V_2O_4 , Cr_2O_3 , Mn_3O_4 , Fe_3O_4 , Fe_2O_3 , Co_3O_4

[JEE Main 2026 (Online) 22nd January Evening Shift]

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- Q.8** A first row transition metal with highest enthalpy of atomisation, upon reaction with oxygen at high temperature forms oxides of formula M_2O_n (where $n = 3, 4, 5$). The 'spin-only' magnetic moment value of the amphoteric oxide from the above oxides is _____ BM (near integer)
(Given atomic number:
Sc : 21, Ti : 22, V : 23, Cr : 24, Mn : 25, Fe : 26, Co : 27, Ni : 28, Cu : 29, Zn : 30)

[JEE Main 2024 (Online) 4th April Evening Shift]

Scan or tap for the
full solution**ANSWER KEY****Section A (MCQ) — 6 questions**

Ques.	1	2	3	4	5	6					
Ans.	2	4	2	1	3	2					

Section B (Numerical) — 2 questions

Ques.	7	8									
Ans.	3	0									