

Questions with Answer Keys

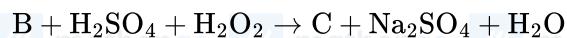
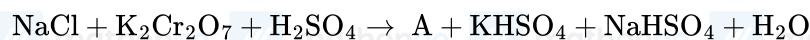
Q1. 21 January Shift 1

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

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

Q2. 21 January Shift 1

Consider the following reactions:



In the product 'C', 'X' is the number of O_2^- units, 'Y' is the total number oxygen atoms present and 'Z' is the oxidation state of Cr. The value of $X + Y + Z$ is ____.

Q3. 21 January Shift 2

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 :

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

Q4. 21 January Shift 2

On heating a mixture of common salt and $\text{K}_2\text{Cr}_2\text{O}_7$ in equal amount along with concentrated H_2SO_4 in a test tube, a gas is evolved. Formula of the gas evolved and oxidation state of the central metal atom in the gas respectively are:

- (1) $\text{Cr}_2\text{O}_2\text{Cl}_2$ and +3
 (2) CrO_2Cl_2 and +5
 (3) CrO_2Cl_2 and +6
 (4) $\text{Cr}_2\text{O}_2\text{Cl}_2$ and +6

Q5. 22 January Shift 1

A first row transition metal (M) does not liberate H_2 gas from dilute HCl. 1 mol of aqueous solution of MSO_4 is treated with excess of aqueous KCN and then $\text{H}_2\text{S(g)}$ is passed through the solution. The amount of MS (metal sulphide) formed from the above reaction is ____ mol.

- (1) 0
 (2) 3
 (3) 1
 (4) 2

Q6. 22 January Shift 2

Given below are two statements :

Statement I: The first ionization enthalpy of Cr is lower than that of Mn.

Statement II: The second and third ionization enthalpies of Cr are higher than those of Mn.

In the light of the above statements, choose the correct answer from the options given below :

- | | |
|---|---|
| (1) Both Statement I and Statement II are true | (2) Both Statement I and Statement II are false |
| (3) Statement I is false but Statement II is true | (4) Statement I is true but Statement II is false |

Q7. 22 January Shift 2

Among the following oxides of 3 d elements, the number of mixed oxides are ____.

Ti2O3, V2O4, Cr2O3, Mn3O4, Fe3O4, Fe2O3, Co3O4

Q8. 23 January Shift 2

The oxidation state of chromium in the final product formed in the reaction between KI and acidified K2Cr2O7 solution is:

- (1) +6 (2) +3 (3) +4 (4) +2

Q9. 24 January Shift 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

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

Q10. 28 January Shift 1

Given below are two statements:

Statement I: The number of pairs, from the following, in which both the ions are coloured in aqueous solution is 3. [Sc^{3+}, Ti^{3+}], [Mn^{2+}, Cr^{2+}], [Cu^{2+}, Zn^{2+}] and [Ni^{2+}, Ti^{4+}]

Statement II: Th^{4+} is the strongest reducing agent among Th^{4+}, Ce^{4+}, Gd^{3+} and Eu^{2+}.

In the light of the above statements, choose the correct answer from the options given below

- | | |
|---|---|
| (1) Both Statement I and Statement II are false | (2) Both Statement I and Statement II are true |
| (3) Statement I is false but Statement II is true | (4) Statement I is true but Statement II is false |

Q11. 28 January Shift 2

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 ions is diamagnetic.
- E. Acidified permanganate ion reduces oxalate, nitrite and iodide ions.

Choose the correct answer from the options given below :

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

ANSWER KEYS

1. (1) 2. 13 3. (1) 4. (3) 5. (1) 6. (4) 7. 3 8. (2)

9. (4) 10. (1) 11. (2)