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**Max Time : 1 hr** **Class = 11th Chemistry Test Max Marks : 30**

**Redox Code A**

1. Multiple choice questions : [ 1 X 4 = 4 ]
2. In acidic medium, H2O2 changes Cr2 to CrO5 which has two (–O – O–) bonds. Oxidation state of Cr in CrO5 is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 5 | b) + 3 | c) + 6 | d) – 10 |

1. The oxidation state of Cr in K2Cr2O7 is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 5 | b) +3 | c) + 6 | d) + 7 |

1. Which of the following is a set of reducing agents?

|  |  |  |  |
| --- | --- | --- | --- |
| a) HNO3 , Fe2+ , F2 | b) F – , Cl – , | c) I – , Na , Fe2+ | d) Cr2, , Na |

1. A metal ion M3+ loses 3 electrons, its oxidation number will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 3 | b) + 6 | c) 0 | d) – 3 |

1. Assign the oxidation numbers to the underlined elements in each of the following species :

a) NaH2PO4 b) NaHSO4 c) H4P2O7 d) K2 MnO4 [ 1 x 4 = 4 ]

1. Balance the following equations by ion-electron method [ 2 x 2 = 4 ]

a) (aq) + SO2 (g) → Mn2+ (aq) + (aq) [ In Acidic medium ]

b) (aq) + SO2 (g) → Cr3+ (aq) + (aq) [ In Acidic medium ]

1. Balance the following equations by Oxidation number method [ 2 x 2 = 4 ]

a) Fe3O4 + C → Fe + CO b) I2 + HNO3 → HIO3 + NO2 + H2O

1. Balance the following equations in basic medium by ion-electron method and identify the oxidizing agent and the reducing agent. [ 3 x 2 = 6 ]

a) P4 (s) + OH – (aq) → PH3 (g) + H2 (aq)

b) N2H4 (l) + (aq) → NO (g) + Cl – (g)

1. Two half cells are : Al3+ (aq)/Al and Mg2+ (aq)/Mg. The reduction potentials of these half cells are 1.66 V and 2.36 V respectively. Calculate the cell potential. Write the cell reaction also.

[ 2 ]

1. The EMF of the following cells are : Ag | Ag+ (1 M) || Cu2+ (1 M) | Cu : = 0.46 V [ 3 ]

Zn | Zn2+ (1 M) || Cu2+ (1 M) | Cu : = + 1.1 V

Calculate the e. m. f. of the cell : Zn | Zn2+ (1 M) || Ag+ (1 M) | Ag

1. Predict whether the following reaction would occur spontaneously at 298 K : [ 3 ]

Co (s) + Fe2+ (aq) Co2+ (aq) + Fe (s)

Given [Co2+] = 1 M and [Fe2+] = 1 M = 0.28 V , = 0.44 V

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**Redox Code B**

1. Balance the following equations by ion-electron method [ 2 x 2 = 4 ]

a) + C2H2O4 Mn2+ + CO2 + H2O [ In Acidic medium ]

b) + + H+ I2 + H2O [ In Acidic medium ]

1. Balance the following equations by Oxidation number method [ 2 x 2 = 4 ]

a) SnO2 + C Sn + CO b) Hg + HNO3 Hg2 (NO3)2 + NO + H2O

1. Balance the following equations in basic medium by ion-electron method and identify the oxidizing agent and the reducing agent. [ 3 x 2 = 6 ]

a) P4 (s) + OH – (aq) PH3 (g) + H2 (aq)

b) Al (s) + (aq) (aq) + NH3 (g)

1. Two half cells are : Al3+ (aq)/Al and Mg2+ (aq)/Mg. The reduction potentials of these half cells are 1.66 V and 2.36 V respectively. Calculate the cell potential. Write the cell reaction also.

[ 2 ]

1. The half cell reaction with their oxidation potentials are : [ 2 ]

(a) Pb (s) 2 Pb2+ (aq) , = 0.13 V

(b) Ag (s) Ag+ (aq) , = 0.8 V ;

Write the cell reaction and calculate its emf.

1. The EMF of the following cells are : Ag | Ag+ (1 M) || Cu2+ (1 M) | Cu : = 0.46 V [ 3 ]

Zn | Zn2+ (1 M) || Cu2+ (1 M) | Cu : = + 1.1 V

Calculate the e. m. f. of the cell : Zn | Zn2+ (1 M) || Ag+ (1 M) | Ag

1. Predict whether the following reaction would occur spontaneously at 298 K : [ 3 ]

Co (s) + Fe2+ (aq) Co2+ (aq) + Fe (s)

Given [Co2+] = 1 M and [Fe2+] = 1 M = 0.28 V , = 0.44 V

1. Predict reaction of 1 N sulphuric acid with : (i) Copper (ii) Lead (iii) iron. [ 3 ]

= 0.34 volt , = 0.13 volt , = 0.44 volt

1. Can we store : [ 3 ]

(a) Copper sulphate solution in zinc vessel? (b) Copper sulphate solution in silver vessel?

(c) Copper sulphate solution in iron vessel?

= 0.34 V , = 0.76 V , = 0.80 V , = 0.44 V