Time: 2 hours | Chemistry| NEET | Marks: 50

(Test Paper)

NAME OF THE STUDENT:-_____ DATE:-

INSTRUCTION – ATTEMPT ALL QUESTIONS

Q.1. $E^o_{Fe^{2+}/Fe}$ = -0.441 V and $E^o_{Fe^{3+}/Fe^{2+}}$ = 0.771 V, the standard EMF of reaction $Fe + 2Fe^{3+} \rightarrow 3Fe^{2+}$ will be

(a) 0.111V (b) 0.330 V (c) 1.653 v (d) 1.212 V

Q.2. Standard electrode potentials are Fe^{2+}/ Fe; E^o = - 0.44 and Fe^{3+} / Fe^{2+}; E^o = 0.77. Fe^{2+}, Fe^{3+} and Fe blocks are kept together ,then

(a) Fe^{3+} increases (b) Fe^{3+} decreases
(c) Fe^{2+}/Fe^{3+} remains unchanged (d) Fe^{2+} decreases

Q.3. Electrode potential for the following half-cell reactions are

$$Zn \rightarrow Zn^{2+} + 2e^-; E^\circ = +0.76\ V;$$
$$Fe \rightarrow Fe^{2+} + 2e^-; E^\circ = +0.44\ V.$$

The EMF for the cell reaction $Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ will be

(a) -0.32 V (b) + 1.20V (c) -1.20 V (d) + 0.32 V

Q.4. An electrochemical cell is set up ad: Pt; H_2 (1 atm) |HCl(0.1 M)|| CH_3COOH (0.1M)| H_2(1 atm); Pt. The e.m.f. of the cell will not be zero, because

(a) acids used in two compartments are different

(b) e.m.f. depends on molarities of acids used

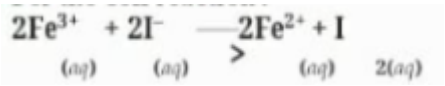
(c) the temperature is constant

(d) pH of 0.1 M HCl and 0.1 M CH C_3OOH is not same.

Q.5. Standard reducation potentials at 25°C of Li^+ | Li, Ba^{2+} | Ba, Na^+| Na and Mg^{2+} | Mg are -3.05, -2.90, -2.71 and -2.37 volt respectively. which one of the following is the strongest oxidisingagent?

(a) Ba^{2+} (b) Mg^{2+} (c) Na^+ (d) Li^+

Q.6. For the cell reaction:



E^{o}_{cell} = 0.24 V at 298 K. The standard Gibbs energy ($\Delta_1 G^{o}$) of the cell reaction is

[Given that Faraday constant, F = 96500 C mol^{-1}]

(a) 23.16 $Kjmol^{-1}$ (b) -46.32 kj mol^{-1} (c) -23.16 kj mol^{-1} (d) 46.32 kj mol^{-1}

Q.7. For a cell involving one electron. E^{o}_{cell} = 0059 V at 298 K, the equilibrium constant for the cell reaction is [Given that $\frac{2.303\ RT}{F}$ = 0.059 V at T = 298 K]

(a) 1.0×10^{30} (b) 1.0×10^{2} (c) 1.0×10^{5} (d) 1.0×10^{10}

Q.8. In the electrochemical cell:

Zn | $ZnSo_4$ (0.01 M) ||$CuSO_4$ (1.0 M)| Cu, the emf of this Daniell cell is E_1. When the concentration of $ZnSO_4$ is changed to 1.0 M and that of $CuSO_4$ changed to 0.01 M, the emf changed to E_2. From the following, which one is the relationship between E_1 and E_2? (given, RT/F = 0.059)

(a) $E_1 < E_2$ (b) $E_1 > E_2$ (c) $E_2 = 0 \neq E_1$ (d) $E_1 = E_2$

Q.9. If the E^{o}_{cell} for a given reaction has a negative value, which of the following gives the correct relationships for the value of ΔG^{o} and K_{eq}?

(a) $\Delta G^{o} > 0$; and $K_{eq} < 1$ (b) $\Delta G^{o} > 0$; and $K_{eq} > 1$

(c) $\Delta G^{o} < 0$; and $K_{eq} > 1$ (d) $\Delta G^{o} < 0$; and $K_{eq} < 1$

Q.10. The pressure of H_2 required to make the potential of H_2 electrode Zero in pure water at 298 K is

(a) 10^{-10} atm (b) 10^{-4} atm (c) 10^{-14} atm (d) 10^{-12} atm