

PYQSide

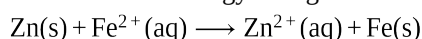
NEET ELECTROCHEMISTRY — CONCEPT OF ΔG AND MAXIMUM WORK DONE BY A GALVANIC CELL — PYQS

Max. Marks: 48

Questions: 12

Section A (MCQ)

Q.1 The standard cell potential of the following cell $\text{Zn} | \text{Zn}^{2+}(\text{aq}) || \text{Fe}^{2+}(\text{aq}) | \text{Fe}$ is 0.32 V. Calculate the standard Gibbs energy change for the reaction:



(Given : 1 F = 96487 C) [RE-NEET (UG) 2024]

- (1) $-61.75 \text{ kJ mol}^{-1}$ (2) $+5.006 \text{ kJ mol}^{-1}$
(3) $-5.006 \text{ kJ mol}^{-1}$ (4) $+61.75 \text{ kJ mol}^{-1}$

Scan or tap for the full solution 

Q.2 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion (A): In equation $\Delta_r G = -nFE_{\text{cell}}$, value of $\Delta_r G$ depends on n.

Reason (R): E_{cell} is an intensive property and $\Delta_r G$ is an extensive property.

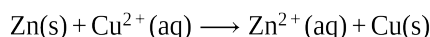
In the light of the above statements, choose the correct answer from the options given below:

[NEET (UG) 2023]

- (1) Both A and R are true but R is NOT the correct explanation of A.
(2) A is true but R is false.
(3) A is false but R is true.
(4) Both A and R are true and R is the correct explanation of A.

Scan or tap for the full solution 

Q.3 Standard electrode potential for the cell with cell reaction



is 1.1 V. Calculate the standard Gibbs energy change for the cell reaction. (Given

$F = 96487 \text{ C mol}^{-1}$) [NEET (UG) 2022 (Phase 2)]

- (1) $-200.27 \text{ J mol}^{-1}$ (2) $-200.27 \text{ kJ mol}^{-1}$
(3) $-212.27 \text{ kJ mol}^{-1}$ (4) $-212.27 \text{ J mol}^{-1}$

Scan or tap for the full solution 

Q.4 For the cell reaction
 $2\text{Fe}^{3+}(\text{aq}) + 2\text{I}^{-}(\text{aq}) \longrightarrow 2\text{Fe}^{2+}(\text{aq}) + \text{I}_2(\text{aq})$
 $E_{\text{cell}}^{\ominus} = 0.24 \text{ V}$ at 298 K. The standard Gibbs energy ($\Delta_r G^{\ominus}$) of the cell reaction is :

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

[NEET (UG) 2019]

- (1) $46.32 \text{ kJ mol}^{-1}$ (2) $23.16 \text{ kJ mol}^{-1}$
(3) $-46.32 \text{ kJ mol}^{-1}$ (4) $-23.16 \text{ kJ mol}^{-1}$

Scan or tap for the full solution 

Q.5 If the $E_{\text{cell}}^{\ominus}$ for a given reaction has a negative value, which of the following gives the correct relationships for the values of $\Delta G^{\ominus}$ and K_{eq} ?

[NEET 2016 (Phase 2)]

- (1) $\Delta G^{\ominus} > 0$; $K_{\text{eq}} < 1$ (2) $\Delta G^{\ominus} > 0$; $K_{\text{eq}} > 1$
(3) $\Delta G^{\ominus} < 0$; $K_{\text{eq}} > 1$ (4) $\Delta G^{\ominus} < 0$; $K_{\text{eq}} < 1$

Scan or tap for the full solution 

Q.6 The electrode potentials for $\text{Cu}_{(\text{aq})}^{2+} + \text{e}^{-} \longrightarrow \text{Cu}_{(\text{aq})}^{+}$ and $\text{Cu}_{(\text{aq})}^{+} + \text{e}^{-} \longrightarrow \text{Cu}_{(\text{s})}$ are +0.15 V and +0.50 V respectively. The value of $E_{\text{Cu}^{2+}/\text{Cu}}^{\ominus}$ will be

[AIPMT 2011 (Prelims)]

- (1) 0.500 V (2) 0.325 V (3) 0.650 V (4) 0.150 V

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Q.7 For the reduction of silver ions with copper metal, the standard cell potential was found to be +0.46 V at 25 °C. The value of standard Gibbs energy, $\Delta G^{\ominus}$ will be

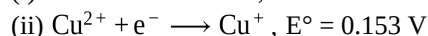
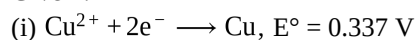
($F = 96500 \text{ C mol}^{-1}$)

[AIPMT 2010 (Prelims)]

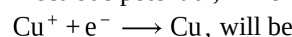
- (1) -89.0 kJ (2) -89.0 J (3) -44.5 kJ (4) -98.0 kJ

Scan or tap for the full solution 

Q.8 Given :



Electrode potential, $E^{\ominus}$ for the reaction,



[AIPMT 2009]

- (1) 0.90 V (2) 0.30 V (3) 0.38 V (4) 0.52 V

Scan or tap for the full solution 

Q.9 Standard free energies of formation (in kJ/mol) at 298 K are -237.2 , -394.4 and -8.2 for $\text{H}_2\text{O}(\text{l})$, $\text{CO}_2(\text{g})$ and pentane (g) respectively. The value of E°_{cell} for the pentane-oxygen fuel cell is

[AIPMT 2008]

- (1) 1.0968 V (2) 0.0968 V
(3) 1.968 V (4) 2.0968 V

Scan or tap for the
full solution



Q.10 The efficiency of a fuel cell is given by

[AIPMT 2007]

- (1) $\Delta G/\Delta S$ (2) $\Delta G/\Delta H$ (3) $\Delta S/\Delta G$ (4) $\Delta H/\Delta G$

Scan or tap for the
full solution



Q.11 On the basis of the information available from the reaction,
 $4/3 \text{Al} + \text{O}_2 \longrightarrow 2/3 \text{Al}_2\text{O}_3$, $\Delta G = -827 \text{ kJ mol}^{-1}$ of O_2 ,

the minimum e.m.f. required to carry out an electrolysis of Al_2O_3 is

($F = 96500 \text{ C mol}^{-1}$)

[AIPMT 2003]

- (1) 2.14 V (2) 4.28 V (3) 6.42 V (4) 8.56 V

Scan or tap for the
full solution



Q.12 Cell reaction is spontaneous when

[AIPMT 2000]

- (1) ΔG° is negative (2) ΔG° is positive
(3) $\Delta E^\circ_{\text{red}}$ is positive (4) $\Delta E^\circ_{\text{red}}$ is negative

Scan or tap for the
full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	1	4	3	3	1	2	1	4	1	2	1
Ques.	12										
Ans.	1										