

Test Paper | Chemistry-XII | Topic – Electrochemistry | Time: 1.5 -Hour,
Marks 30

- 1 Which of the following is used as an electrolyte in an H_2-O_2 fuel cell? 1
 a) KOH
 b) NH_4OH
 c) $Fe(OH)_2$
 d) $Cu(OH)_2$
- 2 NH_4NO_3 is used in salt bridge because 1
 (a) it forms a jelly like material with agar-agar.
 (b) it is a weak electrolyte.
 (c) it is a good conductor of electricity.
 (d) the transport number of NH_4^+ and NO_3^- ions are almost equal.
- 3 Galvanised iron sheets are coated with 1
 (a) Carbon
 (b) Copper
 (c) Zinc
 (d) Nickel
- 4 Rust is a mixture of 1
 (a) FeO and $Fe(OH)_3$
 (b) FeO and $Fe(OH)_2$
 (c) Fe_2O_3 and $Fe(OH)_3$
 (d) Fe_3O_4 and $Fe(OH)_3$
- 5 The standard reduction potentials of X, Y, Z metals are 0.52, -3.03, -1.18 respectively. The order of reducing power of the corresponding metals is: 1
 (a) $Y > Z > X$
 (b) $X > Y > Z$
 (c) $Z > Y > X$
 (d) $Z > X > Y$
- 6 How would you determine the standard electrode potential of the system Mg^{2+} / Mg ? 2
- 7 Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10. 2
- 8 Suggest a way to determine the limiting molar conductivity value of water. 2
- 9 Write the Nernst equation and emf of the following cells at 298 K: 3
 $Mg(s) | Mg^{2+} (0.001 M) || Cu^{2+} (0.0001 M) | Cu(s)$
- $E^\ominus Mg^{2+} / Mg = -2.36 V$
 $E^\ominus Cu^{2+} / Cu = 0.34 V$
- 10 How much charge is required for the following reductions? 3
 (i) 1 mol of Al^{3+} to Al
 (ii) 1 mol of Cu^{2+} to Cu
 (iii) 1 mol of MnO_4^- to Mn^{2+}



- 11 Three electrolytic cells A, B, C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$, respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and zinc were deposited? 3
- 12 Define Fuel cell and write reactions involve it. 2
- 13 What is the role of salt bridge? 1
- 14 Write the structure and mechanism of Lead Storage battery on discharging. 2
- 15 Define faraday 2nd law. 1

Assertion And Reasoning

Directions: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

- (a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
- (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
- (c) If the Assertion is correct but Reason is incorrect.
- (d) If both the Assertion and Reason are incorrect.

- 1 Assertion: In an electrochemical cell anode and cathode are respectively negative and positive electrodes. Reason: At anode oxidation takes place and at cathode reduction takes place. 1
- 2 Assertion: Galvanised iron does not rust. Reason: Zn has more (-) ve electrode potential than Fe. 1
- 3 The resistivity for a substance is its resistance when it is one meter long and its area of cross-section is one square meter. Reason: The SI units of resistivity is ohm meter (m) 1
- 4 Assertion: Emf and potential difference are the same for cells. Reason: Both give the difference in electrode potential under any condition. 1