Student Number (Name):

Q1. How "Climate change" is related to global carbon dioxide reduction efforts?

Q2. What is the role of "Electrochemistry" on Carbon dioxide reduction?

Q3. What is transferred in “Redox Reaction”?

Q4. What is “Reduction” and “Oxidation”?

Q5. Explain the structure of the electrodes of Li-Ion Battery.

Q6. What happens in Anode of the battery?

Q7. What happens in Cathode of the battery?

Q8. What is the “Rocking Chair” mechanism of the Li-Ion Battery?

Q9. Why Si/C composites are the industrial solution (ex. Tesla) as battery material?

Q10. Explain the C-rate and Amp-hours.

Q11. Please explain what happens in Lithium-ion battery when it is charged and discharged with diagram.

Q12. Please explain the reasons of lithium-ion battery fire accident. Why is it hard to control?

Q13. Battery A has 4.8 Ah Capacity and 2.4 A Current. Battery B has 2.4 Ah Capacity and 7.2A Current. (1) Find C rates of Battery A, B and (2) Find which battery has higher C rate.

Q14. What is “Electro-neutrality”?

Q15. Explain how “electrons” in the metal bar work for Electro-neutrality.

텍스트이(가) 표시된 사진

자동 생성된 설명텍스트이(가) 표시된 사진

자동 생성된 설명

Q16. In the following diagram, which metal has higher ionization energy? Why?

도표, 개략도이(가) 표시된 사진

자동 생성된 설명

Q17. In the process of the ionization of Zn metals in Copper Sulfate solution, the surface electrons are removed. Then how the electroneutrality of the whole reactions are preserved?

텍스트, 시계이(가) 표시된 사진

자동 생성된 설명

Q18. In chemical reactions of salt bridge, Zn gets (Oxidized / reduced).   
Cu gets (oxidized / reduced).

도표이(가) 표시된 사진

자동 생성된 설명

Q19. How Zn2+ ions are balanced by the Salt bridge?

Q20. What happens when Cu2+ ions are removed by the reduction reaction?

Q21. Among Which one has higher reduction tendency?

Q22. If those two are used as electrode, which one is cathode?

Q23. Calculate the standard cell voltage (.

Q24. Why perpetual machine can’t exist? (Use the law of 2nd thermodynamics concept)

Q25. Explain what Free Gibbs Energy explains.

Q26. Write the equation of Free Gibbs Energy,

Q27. Write the sign of Free Gibbs Energy, Enthalpy, and Entropy of non-spontaneous reaction.

Q28. Explain the difference of Battery and Fuel Cell.