Question 27 **(10 marks)**

A carpenter left a pair of pliers outside over a rainy period, which subsequently became rusty, causing the joint to seize. Rather than buy a new pair of pliers, the carpenter decided to submerge the rusty part of the pliers in phosphoric acid to remove the rust. Phosphoric acid converts rust into another substance that can easily be washed away.

(a) Write an equation for the action of phosphoric acid on the rust. Assume rust is iron(III) oxide. Include state symbols in your answer. (3 marks)

(b) Identify the best method that the carpenter could use to protect the pliers from rusting further. Explain how this method would be effective. (3 marks)

Method: _____

Explanation: _____

_____

The carpenter noticed that his toolboxes in the back of his truck were also rusting. He decided to explore the use of a sacrificial anode as an option to prevent the toolboxes rusting.

(c) State what a sacrificial anode is and explain how it is effective in preventing corrosion of the toolboxes. You should state which metal could be used for a sacrificial anode in your answer. (4 marks)