

## Assignment 1

**Question 1: [3 marks] Describe an important Canadian engineering or computer science accomplishment of the past 100 years. In 3-5 paragraphs, discuss the context of the accomplishment as well as its significance.**

Dr. John Hopps, an electrical engineer, was a researcher at the NRC working on using radio frequencies to restore body temperature in hypothermia victims. During this research, it was noticed that cardiac arrest often occurred during the hypothermic state. To prevent this, control over heart rate was crucial for survival. Dr. John Hopps discovered through this work that the heart could be started using electricity, which led him to invent the pacemaker.

A pacemaker is a device that is implanted in the body to assist those with abnormal heart beats. The device works by sending electric pulses to the heart to help maintain a normal heart rate and rhythm. The electrical signals cause the heart muscles to contract which helps blood pump throughout the body.

The first cardiac pacemaker was fully developed by 1950, and basically took over the heart's electrical system, artificially pumping blood through the body. According to an article written by Wood and Ellenbogen, there are about 3 million people worldwide with pacemakers, and each year 600 000 new pacemakers are implanted. [2002]

Ward, C., Henderson, S., & Metcalfe, N. H. (2013). A short history on pacemakers. *International journal of cardiology*, 169(4), 244-248.

Wood, M. A., & Ellenbogen, K. A. (2002). Cardiac pacemakers from the patient's perspective. *Circulation*, 105(18), 2136-2138.

**Question 2: [1 mark] In what sense is the Code of Hammurabi relevant to engineers today?**

The Code of Hammurabi is the oldest surviving text from the Babylonian period and is a significant part of legal history. The code contains a law stating that if something should break, someone must pay. Engineers design and construct a vast majority of our man-made environment, which is why it is very important to consider the Code of Hammurabi. It is of large importance to make sure that designs are constructed to be safe and without structural failures. An engineer must be careful when considering judgment, overconfidence, and peer review of their design before constructing it to make sure the design is without fault.

Joshua J. Mark. "Hammurabi," *Ancient History Encyclopedia*. November 12, 2011.  
<http://www.ancient.eu /hammurabi/>