

University of Toronto
Faculty of Applied Science and Engineering

Final examination, April 18, 2001

PHL 291S Engineering and Ethics

Exam type: X

Examiner: M. Balinski

Part 1 (25%): In 100 to 150 words answer only **one** of the following questions:

- a. What is meant by “stacked deck” in organizational ethics?
- b. Should whistleblowers remain anonymous?

Part 2 (25%): In 100 to 150 words answer only **one** of the following questions:

- a. How should you accommodate values of different cultures while working abroad?
- b. Why can engineering be characterized as social experimentation?

Part 3 (25%): In 100 to 150 words answer only **one** of the following questions:

- a. Can Cost -Benefit Analysis be used by someone who does not agree with Utilitarian Ethical Theories?
- b. Present an interpretation of the APEO code of ethics from the point of view of one of ethical theories from the course text package.

Part 4 (25%) Case study:

The heart pacemaker is a modern wonder. The device has a timer that resets itself every time the patient's heart beats. If the heart does not beat on schedule (say, within 1.2 seconds), the pacemaker gives a stimulus that causes a heartbeat.

But the technology was not always so sophisticated, and its early limitations form the background of this true story. Although the events happened 20 years ago, the ethical issues they raise are still relevant.

It's 1975, and you are on the board of directors of a company that makes transistors.

Among the many companies with whom you have a contract is one that makes heart pacemakers.

Pacemaker technology is in its infancy. When doctors implant a pacemaker, the patient's normal heartbeat is disabled, and he or she relies entirely on the device. If it fails, the patient's heart stops. Doctors are not very adept at installing the pacemakers, which are extremely delicate; there is even a story of a person yawning deeply, pulling the pacemaker wire in his chest, and dying.

After that and many similar incidents, the board begins to reconsider whether your company should sell to the pacemaker company. Members of the board feel this situation is a major lawsuit just waiting to happen and your company, as well as the company you supply, will be liable. In addition, you feel the specs the pacemaker company uses to test the transistors are not very strong.

You and the board decide to get out of the business before it's too late. You tell the pacemaker company representatives about your conclusion, and they respond, "You can't stop selling us the transistors. You are the sole remaining supplier for us. Everyone else has backed out for the same reasons you're giving. If you don't sell us the product, we'll go out of business. Pretty soon, no one will be making heart pacemakers, and many people need them. Without the pacemaker, people don't even have a chance."

You take that information back to the board. People around the table have different opinions. One person says, "This is a bad deal, and it isn't our problem. We don't make enough on this sale to make the risk worthwhile." Another person says, "We don't know how other companies use the transistors we sell them; why should we be concerned about this one? What about that baby who died when the transistor in the incubator failed? We didn't know how that company was using the transistor." Another person says, "I think we're missing the real issue here. Don't we have an ethical obligation to sell the product to the pacemaker company? What will happen if we don't sell to them?" Another person says, "Give me a break. Our only obligation is to our shareholders. And how did we get so stupid that we're the last source? I'm telling you, we don't need this." Finally, the chair of the board says, "OK. Let's make a decision."

In 100 to 150 words, on the basis of one of the moral theories that we studied in class, justify the decision to be made.