# CSE487 Cybersecurity, Law and Ethics

## Sample Exam questions from the Ethics Part

**Question type 1.**
Ethical Dilemma Identification and Justification of such dilemma.

Self-driving cars are also known as autonomous cars, driverless cars. These cars are driven by a computer program to minimize the human errors which are the main cause of road accidents. Self-driving cars are already commercialized by Tesla and other manufacturers. However, there is a great deal of ethical dilemma exists in autonomous vehicle research.

**Explain** and summarize the ethical dilemma with examples.
**Why** Machine Learning is not enough for autonomous vehicles?
**Provide** a comprehensive overview of the problems of ethical decision making for autonomous cars.
**Discuss** how human beings act when they face such ethical dilemma in real life (found in the Moral Machine website, the Trolley Problem) towards a completely different outcome.

A prescribed process of ethical decision making is described at the end of this question. You are encouraged to do your own research from scientific papers, books, YouTube videos and so on.

Start your research from these two TED talks:

- *The ethical dilemma of self-driving cars - Patrick Lin*
  *https://www.youtube.com/watch?v=ixIoDYVfKA0*
- *The Social Dilemma of Driverless Cars - Iyad Rahwan*
  *https://www.youtube.com/watch?v=nhCh1pBsS80*
- *The Greater Good - Mind Field S2 (Ep 1: The Trolley Problem in Real life)*
  *https://www.youtube.com/watch?v=1sl5KJ69qiA*
- *The Moral Machine developed by MIT*
  *http://moralmachine.mit.edu*

Such dilemma also exists in the following domains as well:

- Limits to AI
- Automation
- Data Weaponization
- Data Monetization
- Conflict of interest
  And so on.

Please see the chapter 9 of the Sara Baase book for more scenarios that involve ethics.

**Question Type 2.**
**Ethical Decision Making**

- Details of a case/scenario that involves an ethical dilemma and requires decision making in an ethical manner
- Identify the dilemma clearly and the possible/probable decisions
- Justification of the chosen decision based on the Ethical Theories following the steps to ethical decision making.
    - Brainstorming Phase
    - Analysis Phase
    - Decision Phase

Topics could be:

- Self-driving cars (The Moral Machine)
- Use of machine learning for adversarial purpose (Uyghur Detection Dataset)
- Social Rating System
- Limits to Ethical Hacking
- Trustworthiness of AI
    - Trustworthy AI and the foundations of AI systems - Ericsson
    - AI – Ethics inside? - Ericsson
    - AI bias and human rights: Why ethical AI matters - Ericsson
    - Trustworthy AI | IBM
    - AI Ethics | IBM
    - Ethics guidelines for trustworthy AI | Shaping Europe's digital future

- More topics could be found in: Ethics of artificial intelligence - Wikipedia
- Chapter 9 of the Book: A Gift of Fire by Sara Baase.

**Scenario 1.**
Assume that you are an administrator at a major university. Your department selects a few brands of security software to recommend to students for their desktop computers, laptops, tablets, and other devices. One of the companies whose software you will evaluate takes you out to dinner, gives you free software (in addition to the security software), offers to pay your expenses to attend a professional conference on computer security, and offers to give the university a percentage of the price for every student who buys its security package.

You are sensitive to the issue of bribery, but the cost of the dinner and software the company gave you is relatively small. The university cannot pay to send you to conferences. Attending one will improve your knowledge and skills and make you better at your job, a benefit to both you and the university. The percentage from the sales benefits the university and thus all the students. This sounds like a good deal for all.

**Formulate** your plan of actions, in this case, and justify them according to the ethical frameworks.

**Steps to Ethical Decision Making (by *Sara Baase*):**

**Textbook:** S. Baase, ***A Gift of Fire: Social, Legal, And Ethical Issues For Computing Technology*** *(4th edition)*, Boston, MA, United States: Prentice Hall, 2012.
**(See chapter 9)**
**https://slideplayer.com/slide/4905943/**

**Reference:**
A. Adams and R. J. McCrindle, *Pandora's box: Social and professional issues of the information age*. Chichester, England: Wiley, John & Sons, 2008.
J. M. Kizza, *Ethical and social issues in the information age, 5th ed.* London: Springer-Verlag New York, 2013.

**Brainstorming phase: [10 marks]**
- List all the people and organizations affected. (They are the stakeholders.)
- List risks, issues, problems, consequences.
- List benefits. Identify who gets each benefit.
- In cases where there is not a simple yes or no decision, but rather one has to choose some action, list possible actions.

**Analysis phase: [10 marks]**
- Identify responsibilities of the decision maker. (Consider responsibilities of both general ethics and professional ethics, as per ACM/SE Codes of Ethics.)
- Identify the rights of stakeholders. (It might be helpful to clarify whether they are negative or positive rights)
- Consider the impact of the action options on the stakeholders.
- Analyze consequences, risks, benefits, harms, and costs for each action considered.
- Consider Kant's, Mill's, and Rawls' approaches.
- Then, categorize each potential action or response as ethically obligatory, ethically prohibited, or ethically acceptable.

**Decision Phase: [05 marks]**
If there are several ethically acceptable options, select an option by considering the ethical merits of each, courtesy to others, practicality, self-interest, personal preferences, and so on. (In such a case, plan a sequence of actions, depending on the response to each.)

**Scenario 2.**
Your customer is a small community clinic with a small budget. The clinic director is likely to be aware of the sensitivity of the information in the records and to know that inappropriate release of information can result in embarrassment for families using the clinic and physical harm. She is not aware of the risks of the technologies in the system she wants.

You, as the computer professional, have specialized knowledge in this area. It is as much your obligation to warn the director of the risks.

Suppose you warn the director about unauthorized access to sensitive information by hackers and the potential for interception of records during transmission. You suggest measures to protect client privacy, encryption for transmission of records, security measures to reduce the threat of hackers who might steal

data.
You tell the director that carrying client records on laptops or phones has serious risks, citing examples of loss and theft of devices containing large amounts of sensitive personal data. You advise that the system encrypt records on laptops, and you suggest that the director buy laptops with extra security features (such as thumbprint readers, so that only authorized employees can access the data, or remote tracking or erasing features).
The features you recommend will make the system more expensive. Suppose the director says the clinic cannot afford all the security features. She wants you to develop the system without most of them.

**Formulate** your plan of actions, in this case, and justify them according to the ethical frameworks.

**Scenario 3.**
Assume you work for data analytics company called ACME.INC and your client is a large political party named ELEPHANT PARTY. For the upcoming election after a year, the party decided to collect data about the voters. The goal is to identify the voters who support the rival party which is named DONKEY PARTY, as well as the new voters who might tend to vote for either of the parties.

Your job is to collect as many as 5000 data points per voter from their social media accounts (e.g., Facebook, Twitter and Instagram), so that the ELEPHANT PARTY can identify the voters who could vote against them. Also, your job is to identify the new voters, who are not sure about which party to support, and they can be convinced to vote for the ELEPHANT PARTY. Such voters are known as the PERSUADABLE VOTERS.

Furthermore, your client the ELEPHANT PARTY hired another advertising agency GREY.INC, who are going to create highly targeted news and video contents against their opponent party (i.e., the DONKEY PARTY). Your job is to develop a mechanism to target the PERSUADABLE VOTERS, so that the targeted news and videos could be shown in their social media newsfeed(s), so that they don't vote for the DONKEY PARTY.

For that reason, you need to identify the most vulnerable aspects of the characters of the PERSUADABLE VOTERS. Using your analysis, GREY.INC will show targeted contents on their newsfeed, so that the PERSUADABLE VOTERS vote only for the ELEPHANT PARTY, and to convince them not to vote for the DONKEY PARTY.

Since such practices are very new, no such law is there, and the work is not illegal. But the ethics of such actions is questionable. As an employee of ACME.INC, **formulate** your plan of actions considering the professional ethics and justify them according to the ethical frameworks.

**Scenario 4.**
Assume, you are the Chief Executive Officer (CEO) of a company. Your company sells a device (smartphone, tablet, or other small portable device) for which owners can download third-party apps from your app store. The company's published policy says that the company will delete an app from users' devices if and only if the company discovers that the app contains malicious software such as a virus that compromises the security of the devices or of sensitive user data on the devices.

The company discovers that an app has an undocumented but easily initiated component that displays extremely offensive video showing men insulting and violently attacking Chinese people. The company immediately removes the app from its app store and alerts customers to delete the app from their devices.

Should the company remotely delete the app from the devices of all who downloaded it? Give arguments on both sides. Which side do you think is stronger? Why?

**Formulate** your plan of actions, in this case, and justify them according to the ethical frameworks.