**The Way Kosen Students Should Be**

**NIT(KOSEN), Nara College**

A: IIDA Kaichi

B: SAKABE Tatsuya

C: KISHIMOTO Chihaya

A, B: (*Talking with each other while walking*)

C: (*Looking down while walking*)

(*Tatsuya bumps into Chihaya’s shoulder*)

C: Oh, I’m sorry.

B: I am sorry. Are you alright?

C: Yes. Thank you.

A: Are you a freshman?

C: Yes.

A: Which department do you select?

C: I am a freshman of Information Engineering.

A: Oh I see. And your name?

C: My name is Chihaya. How about you?

A: I am Kaichi, a second-grade student of Control Engineering.

B: And my name is Tatsuya, a second-grade student of Electrical Engineering.

C: Nice to meet you!

A: Nice to meet you too. So why did you enroll in National Institute of Technology, Nara College and select Information Engineering?

C: That is because I want to make video games and useful applications. Making applications can make a lot of money, and they can make my imagination more real.

A: That is cool.

C: Thank you. How about you, Kaichi?

A: I want to be an engineer who makes artificial organs. The medical technology is getting better and better day by day and there are artificial organs that assist our daily activities. If this technology develops more, I think more and more people can live longer. So I want to make the artificial organs and help people to live.

C: Wow, you are cool.

B: I think both of you have a great reason. But, do people here know about the current situation of science technology in Japan? *(asking the audience)*

C: The current situation?

A: Of science technology?

C: In Japan?

A, C: I have no idea! (*saying at the same time*)

B: Are you brothers?

A, C: Of course not! (*saying at the same time*)

B: OK. Anyway everybody, let me explain. We have a lot of science technologies now such as\* AI, car navigation system, and medical skills. Everything surrounding us is made by science technology. By the way, what kind of impression does the development of science technology bring to you?

C: I think science technology makes the world more useful.

B: Does science technology really make the world more useful? What do all of you think?

A: It also has many bad influences.

B: That is right. Look at this graph. \* (*showing the graph of the amount of CO2 emission for each way of power generation*) This is about the amount of CO2 emission for each way of power generation.

A: Oh, the nuclear power plants make no CO2.

B: That is right. Nuclear power plants have many advantages. However, it has a lot of problems. (*showing pictures of the Fukushima Daiichi accident*) \*Have you ever seen these pictures?

C: Yes. They are about Fukushima Daiichi Nuclear Power Plant accident.

B: Correct. As you can see, an accident at a nuclear power plant brings terrible damage not only to the plant, but also to the surrounding environment, and the residents.

C: What about the artificial organs? Are there any problems?

A: Yeah, the advantage of artificial organs is that \*they never become ill! However, \*if you were to have many artificial organs, then what would you be? \*Don’ you become a cyborg?

B: Oh. I see. By the way, what is the cyborg?

C: \*Kiyoshi Okamoto, a Japanese doctor, says that the \*cyborg is a fusion of human and machine in his paper. And he also says that the machine needs to be cooperative to human, to work under the human skin, and have no cells.

B: OK. I understand. Is the pacemaker included?

C: Exactly. And all kinds of artificial organs are included. So we can say that the development of the medical technology would make human beings cyborg.

B: It’s interesting. But what is the problem?

A: OK. It is often said that, according to Isaac Asimov, when you make robots, \*you have to follow two principles about robots which have a will like AI. \*The first is that robots may not hurt human beings and another is that robots must obey the orders given by human beings. However, what would happen if those who give the orders were to become a cyborg? The robots which accept the orders would not be able to judge clearly whether the commander is a human being or not.

C: Oh. If so, the robots would not have to obey the commanders because they were no longer human beings. In addition, it may occur that the robots would possibly hurt the commanders.

B: Oh,\* like terminator?

C: Exactly!

A: \*Like rebellious Doraemon?

B: Haha. Anyway, we must make some rules to determine whether the commander is a human or not.

A: Exactly. Does everyone have any example?

C: The percentage of the part that the machine accounts for.

B: That makes sense. Now we talked about the negative aspect of the science technology. So keeping in mind the negative aspects of the Japanese science technology, \*what do you think Kosen students should be like?

C: Tatsuya, you must have some ideas, right? *(saying to audience)*

B: Haha, OK. \*I think engineers should consider not only the positive side of science technology, but the negative side more. So-called \*risk management. And I think Kosen students should learn it early because they begin to work earlier than students of other high schools.

C: I see.

B: What about you?

C: In order to solve the science technology problems, we need to have \*creative thinking. If we could solve the problems with ideas which everyone can imagine, we would never have these problems now.

A: Yes. That is right. But what is the creative thinking?

C: Creative thinking is the thinking which enables us to solve problems while we do not have any problems.

A: Oh, I see.

C: For example, \*the biomass generation. This is because it can reduce the amount of CO2 emission when making electricity and it uses garbage, which we think damages the environment, as one of the resources.

B: That is a good idea. What do you think, Kaichi?

A: Tatsuya said engineers should consider the negative side of the science technology more, right? But I think engineers may well think that “let us not develop this field because it has problems” if they consider the risk management. As a result, the Japanese science technology would not develop very much and Kosen students would never be required. So I think engineers should consider \*the positive side and the negative side equally. Don’t you think so? *(asking audience)*

B: That might be right. So how about solving problems by developing other fields of science technology?

C: That is a good idea.

B: I want to continue this discussion but my class will start soon. So \*let us summarize our talk.

C: \*First we talked about the negative aspects of the science technology such as \*the Nuclear Power Plants, and the cyborg problem.

B: Yes. \*And Kosen students need to consider those bad influences caused by science technology.

A: In order to solve those problems, we, Kosen students, need \*the risk management and the creative thinking.

B: That is right!

C: Thank you for giving some good advice. I learned a lot.

B: Thank you too. I had a wonderful time talking with you.

A: Yeah. Me too.

B: And we have to say thank you once more, don’t we?

C: To audience right?

B: Yes.

A,B,C: \*Thank you for listening. (*Saying at the same time*)