T/O

PART 1

Good morning everyone. In the reading part of the exam, you read about the meaning of Research and Development, or shortly R&D. You also saw how governments can encourage R&D activities. In our lecture now, we will try to understand why businesses and governments want to increase their R&D activities. In order to answer this question, I will first talk about the developmental steps of R&D. Then, I will talk about the relationship between R&D and productivity growth. **(PAUSE)** In the second part of our lecture, we will discuss positive effects of R&D on economic growth, and the necessary conditions for a successful R&D project.

Well...To start with, if we want to have a better understanding of R&D, we should remember that there are three steps in a typical R&D process. **First**, R&D develops an old piece of knowledge into a new form. **(PAUSE) Second**, a new idea is created on this new form. **(PAUSE)** And **finally,** this new idea is transformed into a practical form. In other words, a new, marketable product is developed. In fact, the most important step of these three is the last one; **transforming this new idea into a marketable product,** because this step directly provides a business with productivity. **(PAUSE)**When a business is more productive, that business can grow easily and make more money. Therefore, high productivity is clearly the most valuable aim of a business that wants to grow easily and make more money. **(PAUSE)**

So, what do I mean by productivity? Basically, **productivity** is the relationship between input and output. **(PAUSE)**When I say input, I mean time, energy, or money put into a work. **(PAUSE)**And output is the product, or the end result of that work. **(PAUSE)**If a business spends a lot of time, energy, or money on production, this may not be profitable. So high productivity means, the business spends less time, energy, or money, and it gets more products and higher quality in return. **(PAUSE)**

Now that we have learned what productivity is, let's now look at the relationship between R&D and industrial productivity. **(PAUSE)** Well, since 1776, businesses have known that there is a direct relationship between R&D and industrial productivity. The first person to prove this direct relationship was Professor Adam Smith. **(PAUSE) In 1776,** Professor Adam Smith proved that specialized knowledge on a specific area increased the productivity of an industry as well. Basically, Adam Smith said that knowledge in one area resulted in industrial productivity. **(PAUSE)** This might look very simple to us modern people. But we should remember that this period was the beginning of the industrial age. Even the idea of industry was new. Having specialized knowledge was really important for newly-starting businesses because it helped people work more productively. **(PAUSE)** So, this meant that industries had to have specialized knowledge, and at this point, RESEARCH and DEVELOPMENT was needed to increase their productivity. **(PAUSE)**

OK... Adam Smith was the first person to understand the importance of R&D for industry. But it was actually Robert Solow who first made a connection between R&D and productivity growth. **(PAUSE)**In 1957, Robert Solow did a research on the relationship between R&D and productivity growth. What did Robert Solow find as a result of his research? He found that there was a direct relationship between the ***amount*** *of specialized knowledge* and *its positive effects on productivity growth.* **(PAUSE)** In other words, R&D increases specialized knowledge that is necessary for production. And this specialized knowledge leads to higher productivity growth. **(PAUSE)**

OK, R&D increases productivity growth, but who benefits from this increase? Productivity growth is good for *companies, workers, customers*, and *society* in general. **(PAUSE)**

First, let's talk about companies. As I said before, productivity growth is necessary for a company because it can produce better quality products by spending less money. **(PAUSE)**This means that the company spends less money **but** can sell higher quality products. So, increased productivity means increased profits for a company. **(PAUSE)**

Second, workers... Workers of a company can greatly benefit from productivity growth as well. When a company increases its productivity, and makes more profit, it has more money to spend for its workers. The company can spend money *to pay higher salaries, to improve working conditions, and to train its workers*. Therefore, with productivity growth, workers can enjoy higher salaries, better working conditions, and job training. **(PAUSE)** Third, customers of course... Productivity growth is also beneficial to customers. When a company is productive, its customers can buy better quality products without paying a lot of money. Because production costs are lower, the company doesn't have to sell the better quality at a higher price. **(PAUSE)** And lastly, I would like to talk about how society benefits from productivity growth. **(PAUSE)** Productivity growth has a positive impact on the well-being of ***everybody*** in a country. When companies and workers can pay their taxes regularly, the government of that country can have a stronger economy. A stronger economy decreases the risk of having financial problems. **(PAUSE) Besides**, with a strong economy, the government can offer better services to its society. **(PAUSE)** For example, it can provide better education and health services. **(PAUSE)** It can also create new job areas to increase employment rate. **(PAUSE)** In short, productivity growth has a positive impact on everybody in a society by making the economy stronger. And a stronger economy leads to ***better education, better health services, and more jobs*** for everybody. **(PAUSE)**

OK, so far, we have talked about the definition of R&D, and its positive effects on productivity growth. In the second part of my lecture, I will talk about economic growth and necessary conditions for successful R&D projects. But first, answer the questions for the first part. (978 words)

PART 2

Hello again. In the second part or my lecture, we will first talk about the positive effects of R&D on economy. **(PAUSE)**After talking about R&D's positive effects on economy, we will analyze the necessary conditions for an R&D project to happen. **(PAUSE)**

In order to understand the positive effects of R&D on economy, we need to look at the economic situation in the world. Despite all the talk of a global economic crisis, the global economy is in fact stable in most parts of the world. **(PAUSE)** Statistics show that, between 2003 and 2008, the annual economic growth rate was three point two percent on average. **(PAUSE)** A yearly growth of three point two percent is actually a high figure. In the late 1990s, this yearly growth rate was never more than two point seven percent. However, in the last five years, it has been much better than that. Between 2008 and 2013, the global economy is going so well that it has made a historic growth. The growth rate between 2008 and 2013 has been four point five percent. **(PAUSE)** Four point five percent is the biggest growth rate since the Second World War. **(PAUSE)** Economists are also optimistic about the future. With the amount of money spent on research and development, a higher growth rate is expected in the next five years. Between 2013 and 2018, the growth rate is expected to be five point five percent. **(PAUSE)** So how has the world economy grown bigger despite all the problems in the world? Well the answer to this question is simple: never-ending R&D projects. Surely, the key actor of this economic growth has been R&D. **(PAUSE)**

Of course it is not easy to explain the effects of R&D on economy**,** because there are many other factors that affect economy. However, we can simply say that there are 3 main ways how R&D affects economy positively: **(PAUSE)**

1) R&D helps build sector-leading organizations such as Microsoft, Rolls Royce and Apple; **(PAUSE)**

2) R&D attracts the best experts on a subject. For example Google and The Coca-Cola Company employ the top experts in their fields; **(PAUSE)** and

3) R&D supports **the search for innovative knowledge.** Innovative companies such as Toyota or Adidas are good examples of companies where R&D supports the search for new knowledge. **(PAUSE)**

Well. As you know, all these companies are the leaders of our globalized world. At this point, it might be a good idea to talk about globalization and R&D. **(PAUSE)** In fact, globalization itself is a product of R&D. Through globalization, R&D allows companies to exchange *problems, ideas*, and *solutions*. **(PAUSE)** Problems, ideas, and solutions are shared globally, and in this way, national economies have become more **interdependent**. **(PAUSE)** So globalization is creating a world where economies of different countries are **not** independent, but they are increasingly connected to each other. **(PAUSE)**

So far, we have seen that R&D projects lead to economic development. Of course, for economic development, R&D projects need to be successful. **(PAUSE)** So, what are the necessary conditions for an R&D project to be successful? As you can guess, there are many factors that are in play, but we will focus on only three of these necessary conditions: public support, financial support, and scientific support. **(PAUSE)**

First, public support... Obviously, the social situation in a country should support research and development. **(PAUSE)** In order for an R&D project to have public support, it should aim at solving people's problems. If the people in a country think that an R&D project can provide solutions to their problems, they support the project. In addition to providing solutions to problems, an R&D project must be adaptable. What I mean by adaptable is that the project should consider the needs of that particular society. **(PAUSE)** In short, for an R&D project to be successful, it needs the support of the public. And the public will give that support only when the project provides solutions to their problems, and when it can be adapted for the needs of that society. **(PAUSE)**

AS FOR financial support, I don't think it is necessary to remind you that money is power, so I'll keep this part very short. Although spending a lot of money on R&D does **not** guarantee success for a project, **not** spending enough money almost guarantees failure. An R&D project must be supported with enough money, and if this does not happen, the project will probably fail. **(PAUSE)**

The third necessary condition for an R&D project to be successful is scientific support. This is where a good relationship between universities and industry becomes very important. **(PAUSE)** A company may have great experts, great ideas, and enough money for research and development. But, their project will need one more thing to succeed: **the necessary knowledge**. **(PAUSE)** Most of the scientific research in the world is done in universities. So, universities and industry should collaborate and bring their resources together. So, an R&D project needs university support as well. **(PAUSE)** American universities in general are the number one in R&D and Japanese universities come second. Chinese universities have the third place. **(PAUSE)** However, Chinese universities have been spending more money on R&D than the Japanese, so they will probably be the second in the future.

Yes, that is it for today. We talked about the effects of R&D on economic growth, and necessary conditions for R&D to take place. Now, please answer the questions for the second part. (1031 words)