

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Mid-term Examination: Semester II

Academic Year: 2013

Date: January 5, 2014

Time: 9:00-12:00.

Subject: 225-503 Production Systems & Management

Room: A302

Instructions

- Answer all 5 questions in the **answer**-book provided
- Open-book exam. Any materials, books, papers, calculators and dictionaries are allowed.
- Total score is 70.

Questions	Full Score	Assigned Score
Q1	10	
Q2	15	
Q3	15	
Q4	15	
Q5	15	
Total	70	

Assoc. Prof. Somchai Chuchom

ทฤษฎีในการสอบ โทษขั้นต่ำคือ ปรับตกในรายวิชาที่ทฤษฎี และพักการเรียน 1 ภาคการศึกษา

Question 1 (10 marks)

For the "Minimum structure" MS Block diagram supplied in Figure 1, draw the corresponding "Basic MS Structure Matrix"

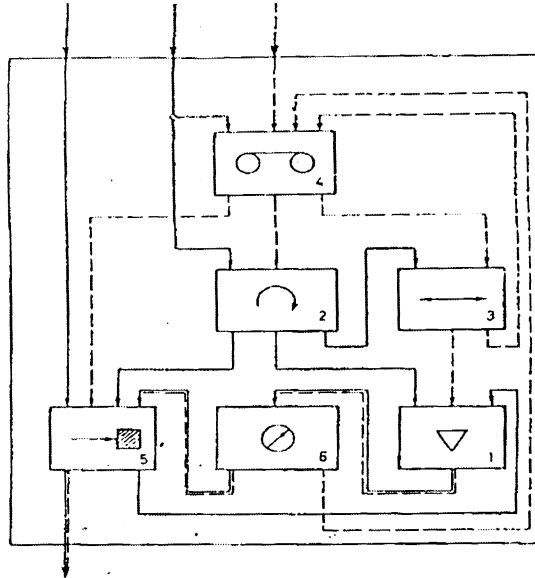


Figure 1

Question 2 (15 marks)

Think of a new or revised product that you would like to see on the market. Discuss the implications of producing that product relative to legal, ethical, environmental, profitability, competitive, design, and production issues.

Question 3 (15 marks)

If you were asked to manufacture high precision 18-8 stainless steel bolts and nuts, where quality and production rate are of primary concern, which process or processes would you choose? Write down the main processes (flow process chart) and discuss your answer.

Question 4 (15 marks)

Choose one of a specific engineering material. Show what you know about it. Explain its availability until ready for the users.

Question 5 (15 marks)

Read the case study on "China Design: A Global Center for Hot Products", and answer the questions

China Design: A Global Center for Hot Products

READING



Sony had a problem in China: The company was seen by many young Chinese as Daddy's brand. So in August the company opened a design center in Shanghai. The three designers there quickly set about trying to understand the lives of young Chinese, giving 50 of them digital cameras and asking them to document their daily lives in photographs.

By September the designers had tacked dozens of the pictures—people in their bedrooms, hanging out with friends, playing basketball—onto the wall and divided the group into seven categories, such as “Cheerful Next Generation” and “Try Hard for Life.” Then the team set out to design a line of MP3 players that would appeal to the trendsetters in these groups. The devices, in muted colors with a smooth river-rock-like appearance, are scheduled to hit the market in China early next year. “If we understand [young Chinese], we can design better products for them,” says Katsumi Yamatogi, the veteran Sony Corp. designer who heads the studio in Shanghai's trendy Xintiandi district.

Playing Catch-Up

There's a lot of that going on in China these days. As Chinese companies seek to build global brands and foreigners aim to boost sales in the mainland, they're transforming the country's design business. Chinese manufacturers realize they need better products if they want to break out of China and beef up their margins on sales abroad.

This is powering a boom in design on the mainland. The best Chinese companies are building their design staffs or hiring outsiders to help them make more products of their own. Design is one of the most popular majors at Chinese universities today, and hundreds of design consulting firms have sprung up in Shanghai, Beijing, and Guangzhou. “Large companies [in China] are saying: ‘We can't catch up fast enough,’” says Craig M. Vogel, a professor of design at the University of Cincinnati who has worked as a consultant to several companies in China. Even young designers from abroad are flocking to Beijing and Shanghai to try their luck in the world's most dynamic consumer market.

That's a dramatic change from just a few years ago. Although China manufactures the bulk of the world's electronics, shoes, and much more, those products typically have been designed in Europe, the United States, or Japan. When Chinese companies did make their own products, as often as not they copied designs from abroad. Today, in contrast, just about everyone in China seems to want to be the next Samsung. A decade ago the Korean conglomerate was a second-tier brand that made me-too consumer electronics. But after years of focusing on design, Samsung today earns more awards for design than even Sony or

Apple Computer, and it's one of the world's most valuable brands. “Design is the way companies improve their competitiveness,” says Yu Zida, a vice president who oversees design at appliance maker Haier Group Co.

One problem faced by domestic companies and foreigners alike is a lack of trained designers. Stefan Fritschi of UW's Shanghai operation, for instance, asked that the names of his designers not be published lest they be poached by rivals. To some extent, that gap is starting to be filled. Since Hunan University opened China's first school of design in Changsha 23 years ago, the discipline has taken off. Beijing's Tsinghua University is opening a new 60,000-square-meter design building, and in Guangzhou the Academy of Fine Arts just moved to a new eight-story facility with enough space for 3,000 industrial design students—five times its current capacity. Today, China has some 400 schools offering design classes that together graduate some 10,000 industrial designers annually, up from just 1,500 or so five years ago. “Design schools are popping up like bamboo shoots,” marvels Yan Yang, chairman of Tsinghua's industrial design department.

The other issue: The best Chinese companies know design is crucial. But others still haven't learned the lesson that it's worth spending money on design to distinguish their products in the marketplace. “Manufacturers don't think about what makes good design,” says Zhou Yi, president of S.point Design, a Shanghai consulting firm that has done work for Siemens, Intel, and many Chinese companies. “They really just focus on looks rather than functionality.”

Chinese designers are succeeding in international competitions. A student from Hunan University last year earned the top prize in the biennial Nagoya Design Do! competition for young designers. The project was a milk carton that has the day's weather printed on top—which gives milk drinkers useful information and spurs dairies to keep their milk fresh. A graduate of the Tianjin Academy of Fine Arts studying in Germany was one of five finalists for the prestigious Braun Prize this year for a portable shelter that can be constructed quickly—almost like a tent—for a concert or sporting event.

The renaissance can be seen at the best Chinese companies, too. Lenovo has doubled its design team, to 80 people, since 2002. The computer maker—which bought IBM's PC Division in May—this year won an Industrial Design Excellence Award for its ET960 smart phone. Yao Yingjia, Lenovo's chief designer, has broken down much of the Confucian hierarchy that hobbles innovation at Chinese enterprises and employs many of the same management techniques used by industry leaders worldwide.

Every year, Yao takes team members on a two-day retreat where they bond by building rafts from scrap materials and sailing

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them across a lake. And when designers are working on, say, a new cell phone or laptop, they take over a "war room" for the duration of the project. There, team members paste photos of competing products on the wall, brainstorm about the attributes of the device, carve clay mockups, and immerse themselves in the project for weeks or months. "Asian culture is very top-down," says Yao. "But if you give your people too much direction, you won't get any surprises, and as a manager I like to be surprised."

Some of the best surprises, Yao says, come when his designers combine traditional elements of Chinese culture with today's technology. In one instance, a designer charged with developing a speaker phone modeled his proposal after the traditional Chinese "hot pot," a serving dish that families place in the middle of the table and share. The phone, which looks like a red and black dish, includes a remote control that balances on its tip in the center of the "dish" and automatically rights itself when it gets pushed over, like a wobbly doll. "This is a great example of a product that combines culture, style, and function," says Yao.

The best Chinese companies also are showing a commitment to getting designs right if they don't work out the first time. Appliance maker Haier Group, for instance, discovered through its research that people in Saudi Arabia like extra-large washing machines to hold the bulky robes that are common there. So the company started shipping a machine with a wash tub that could hold 6-kg loads, but it didn't sell particularly well. Two years later the company increased the size of the tub to 9 kg. It sold a relatively disappointing 6,000 units. In February, Haier tried again, this time with the biggest tub it makes—12 kg. The product has been a hit, selling 10,000 machines since its launch.

Questions

1. Why is product design important in the China market?
2. How would you ensure that your products are designed to meet the needs of customers?

Source: From "China Design," *BusinessWeek*, 11/21/2005.
