

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Mid-term Examination: Semester II

Academic Year: 2011

Date: December 20, 2011

Time: 9:00-12:00.

Subject: 225-503 Production Systems & Management

Room: หัวหุ่นยนต์

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 90

Questions	Full Score	Assigned Score
Q1	15	
Q2	20	
Q3	20	
Q4	10	
Q5	25	
Total	90	

Assoc. Prof. Somchai Chuchom

ทฤษฎีในการสอบ โทษขั้นต่ำคือ ปรับตกในรายวิชาที่ทฤษฎี และพักการเรียน 1 ภาคการศึกษา

Question #1 (15 marks)

Consider the process of water-filling-and-capping by the automatic filling and capping machine as shown in Figure 1. You can assume some elements of inputs/outputs if necessary. Using this information to identify the followings:

- 1.1 The subsystems
- 1.2 The system hierarchy
- 1.3 A coupling matrix, k_{12}
- 1.4 A block diagram of the system

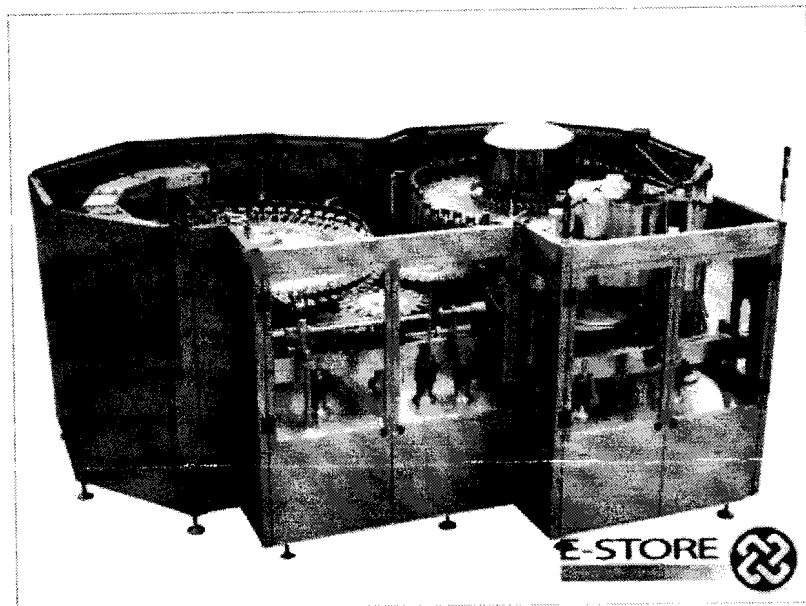


Figure 1

Question #2 (20 marks)

Explain three major aspects meant by 'Manufacturing Systems', and also demonstrate how to integrate these major aspects in order to obtain the optimum goal of manufacturing.

Question #3 (20 marks)

3.1 Describe the major considerations involved in selecting materials for products.

3.2 What factors are involved in the selection of manufacturing processes? Explain why they are important.

3.3 A material is required to manufacture office scissors. Paper is an abrasive material, and scissors sometimes encounter hard obstacles like staples. List the function and the constraints; set the objective to "minimize cost" and the free variables to "choice of material."

Question #4 (10 marks)

A typical life cycle of a product is shown in Figure 2. How can you make use of this information in product design? Explain.

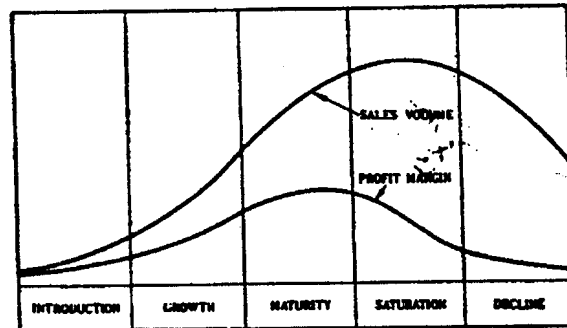


Figure 2

Question #5 (25 marks)

5.1 How can manufacturing processes be classified? Select one process and explain its main characteristics, the considerations when applied to work such as production rate, quality, and flexibility.

5.2 In your opinion which manufacturing process possesses the highest degree of flexibility? What criteria led you to your choice?
