

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Examination : Semester 1

Academic Year : 2004

Date : August 1, 2005

Time : 9.00-12.00

Subject : 226-439 Logistics & Material handling system

Room : R300

**Directions :**

- Can take any books to the room.
- Show your solutions and method on the exam sheet.
- There are 7 problems, 100 points. You must do all of them.
- Can use any calculators.

Name..... Code .....

Question	Full Scores	Taken Scores
1	10	
2	15	
3	15	
4	10	
5	20	
6	15	
7	15	
<b>Total</b>	100	

ทูลจรลทในการสอบ โทษขั้ันต่ำปรบัตทในรายวลชาขั้ัน  
และพัทการเรลยห 1 ภาคการศลทษา

Wanida Rattanamanee

Lecturer



1. Explain the meaning of the figure 1 in the scope of Logistics & Material Handling System? (10 points)

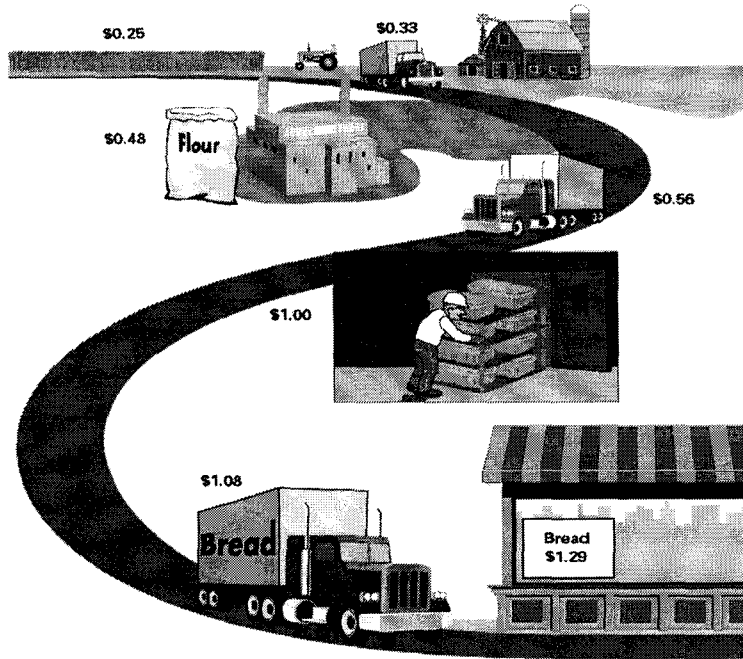


Figure 1

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2. What is the meaning of "Logistics" and "Material Handling System"? How is material handling system related to logistics? **(15 points)**

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3. From the 3 following equations, how can they apply to measure the material handling system and give examples of their applications for each equation?(15 points)

picking accuracy = (number of items picked without errors)/( total number of items picked) ...(1)

warehouse damage percentage = (number of warehouse damages per year)/(total number of shipments per year)...(2)

Inventory accuracy = (number of warehouse locations without discrepancies)/(total number of warehouse locations) ...(3)

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4. Explain the meaning of Figure 2 ( 10 points)

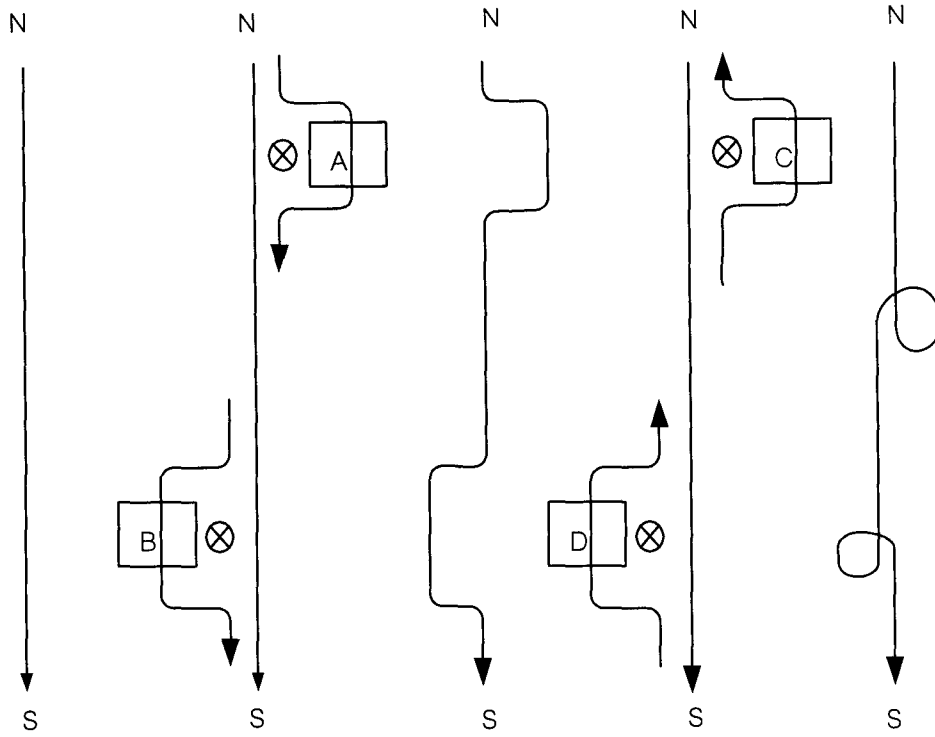


Figure 2

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5. In the para-wood furniture manufacturing (as you visited the APS factory from the class), you have to design the automated material handling system for the factory. Write and explain your design for the system. (20 points)

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6. Five manufacturing departments labeled A, B, C, D, and E are to be assigned among the six sites, of size 4×4 feet each as shown in Figure 3. Five products are processed through the five departments according to the processing sequences and frequencies of movement between department as shown in Table 1. **(15 points)**

**Table 1** The processing sequences of each product and frequencies of movement between departments

Product	Processing Sequence	Flow Frequency
1	A,B,C,E,D	100
2	A,C,B,C,D,E	150
3	A,B,D,E,C	200
4	A,C,D,B,E	150
5	A,B,C,D,E	100

1	2	3
4	5	6

**Figure 3** Sites

2.1 Develop frequencies from-to-chart (from a department to another department) and the distance from-to-chart (from a site to another site) associated with the problem, assuming material movement between departments is from centered to centered and along the aisles only.

2.2 Suppose an initial assignment of departments is below:

Dept .A located in site 2,

Dept. B located in site 4,

Dept. C located in site 3,

Dept. D located in site 1,

Dept. E located in site 6.

What is the cost associated with this assignment if transportation cost is 2 bath per trip per foot? Develop a new layout that improve from the initial layout.

7. Using the information contained in the table 2, do each of the following

7.1 Draw a precedence diagram. **(5 points)**

7.2 Assuming an eight-hour workday, and an output of 400 units per day. Determine the cycle time and the minimum of workstation required. **(5 points)**

7.3 Assign tasks to workstaions and compute the resulting efficiency of the system. **(5 points)**

**Table 2** Tasks for the question 7

<b>Task</b>	<b>Immediate Follower</b>	<b>Task Time (in minutes)</b>
<b>A</b>	B	0.2
<b>B</b>	E	0.2
<b>C</b>	D	0.8
<b>D</b>	F	0.6
<b>E</b>	F	0.3
<b>F</b>	G	1.0
<b>G</b>	H	0.4
<b>H</b>	end	0.3
<b>Total time</b>		3.8

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