

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Final Examination : Semester 2

Academic Year : 2007

Date : February 18, 2008

Time : 13:30-16:30

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	15	
2	10	
3	20	
4	15	
5	10	
6	10	
7	20	
Total	100	

ทูลจรตใการสอบ โทษซันด้าปรบตทใรายวชานัน และพัทการเรยน 1 ภาคการศกษา

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Lecturer

1. Assume a container is 8 feet wide, 8 feet high and 40 feet long. Assume your product package is 20 x 20 inches and is 10 inches high. If you use a pallet size of 40 × 60 inch., justify your number of packages per container. Determine the following questions,

1.1 How many packages can be arranged per pallet?

1.2 How many pallets can be arranged per container?

(15 points)

2. From Figure 1, it is the concept of unit load design. Explain the detail of this idea ? (10 points)

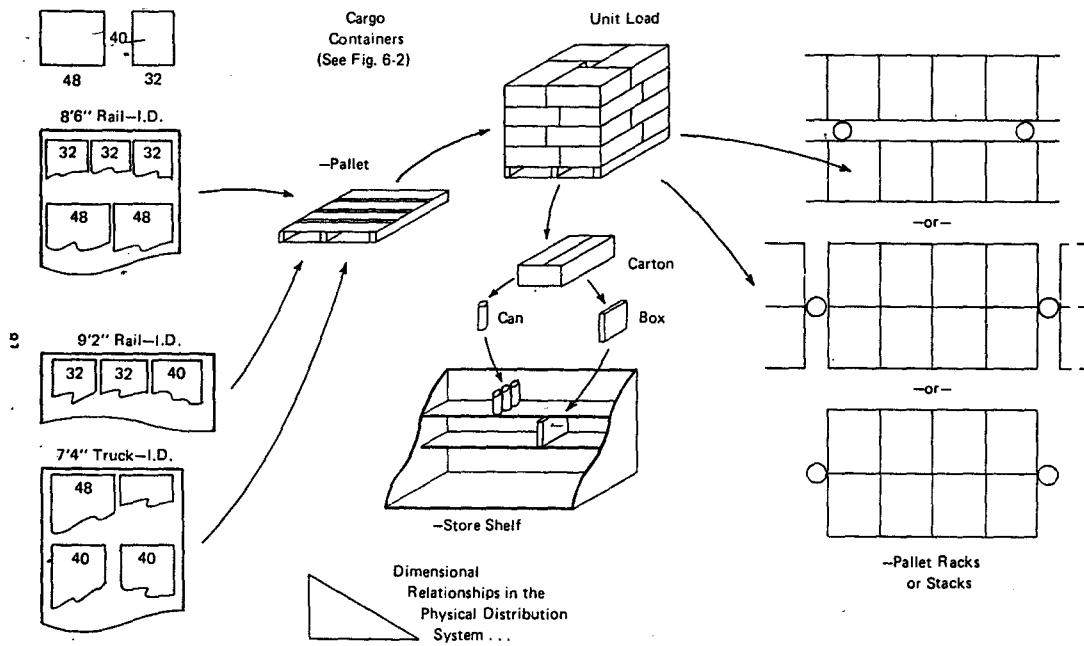


Figure 1

Handwritten mark resembling a stylized 'A' or '4'.

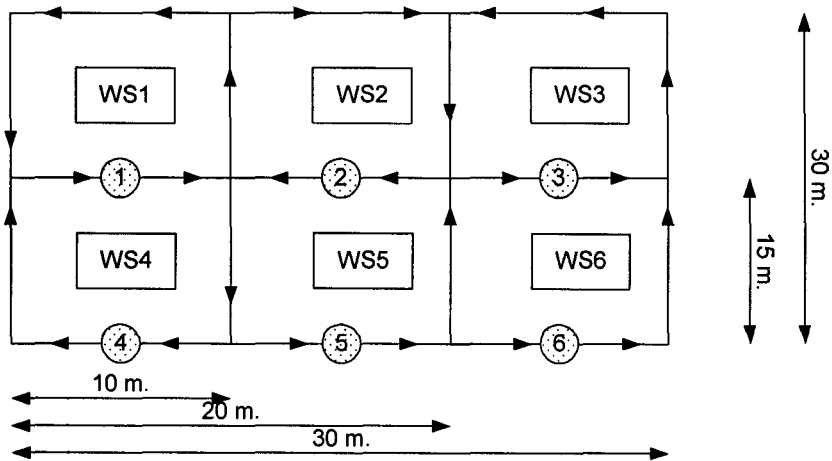
3. In a factory, there are 6 workstations, WS 1, WS 2, WS 3, WS 4, WS 5, and WS 6. There are 5 products; A, B, C, D and E produced in the factory by these 6 workstations. Production type, production scheduling, production capacity, and product weight of each product are shown in Table 1. The factory manager would like to apply AGV system for the production. He designed AGV guided path as shown in Figure 2. Material handling capacity of the selected AGV type is 10 kilograms per trip. Its velocity is 1.5 meter per minute. Its efficiency is 0.9 and it has to be charged the energy after it works for 8 hours ($t = 45$ minutes). Pick up and drop off time is 0.6 and 0.8 min. respectively. There are 10 work hours per day. Determine the following questions

3.1 g_{12} , g_{13} , g_{23} , g_{35} , g_{36} and g_{45} (6 points)

3.2 How many AGV should be applied in the factory. (use the 2nd case, equation 7.3, from chapter 7 of the book.) (12 points)

Table 1 Detail of production

Product type	Production scheduling	Production capacity (parts/day)	Weight (kg.)/ part
A	1 → 3 → 4 → 5 → 6	10,000	1.0
B	2 → 3 → 4 → 5 → 6	8,000	1.5
C	1 → 2 → 3 → 4 → 5 → 6	9,000	0.8
D	1 → 3 → 4 → 5 → 6	10,000	0.5
E	1 → 2 → 3 → 4 → 5 → 6	7,500	1.0



○ = Pick up and drop off point

Figure 2 Guided path layout



- 3.1 g_{12} =
- g_{13} =
- g_{23} =
- g_{35} =
- g_{36} =
- g_{45} =

3.2 From-to Chart Table

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4. Design a material flow system for Tesco Lotus or Carefour Department Store at Hadyai. (15 points)

5. Show an example of a flow process chart. (10 points)

6. What is gripper? What are its benefits? What are the problems of gripper? (10 points)

