Final Examination : Semester 1   Academic Year : 2006

Date :   October 4, 2006   Time : 9.00-12.00

Subject : 226-439 Logistics & Material handling system   Room : A203

Directions :

- ❑   Can take any books to the room.

- ❑   Show your solutions and method on the exam sheet.

- ❑   There are 6 problems, 70 points. You must do all of them.

- ❑   Can use any calculators.

Name……………………………………………Code …………………………………..

Question	Full Scores	Taken Scores
1	10	
2	10	
3	20	
4	10	
5	10	
6	10	
7	10	
8	10	
Total	90	

ทุจริตในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น และพักการเรียน 1 ภาคการศึกษา

Wanida Rattanamanee

Lecturer

1. Assume a truck is 90 inches wide, 105 inches high and 44.5 feet long. Assume your product package is 24 x 20 inches and is 12 inches high. If you use a pallet size 40 × 48, justify your number of packages per truckload. Determine by your own knowledge (it's not necessary to use any equation from the book), then answer 2 following important questions and show methods which are applied to determine.

      1.1 How many packages can be arranged per pallet?

      1.2 How many pallets can be arranged per truck?   **(10 points)**

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2. From Figure 1, It is the application of unit load design. Explain how unit load design is applied for this and what is the benefit for this?   (**10 points**)
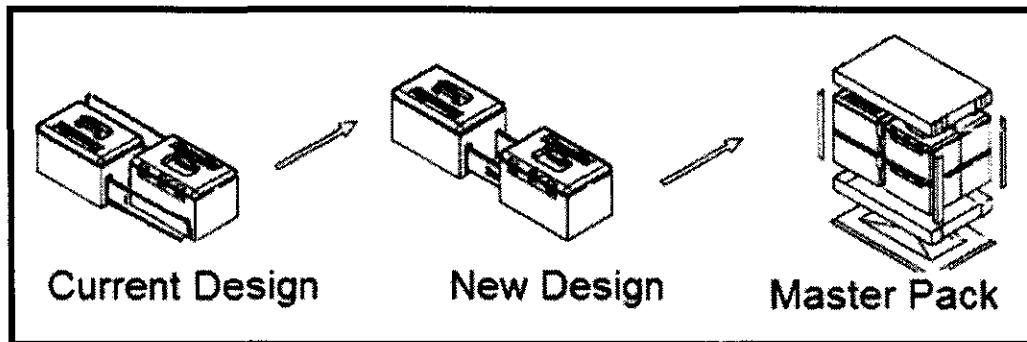

Figure 1

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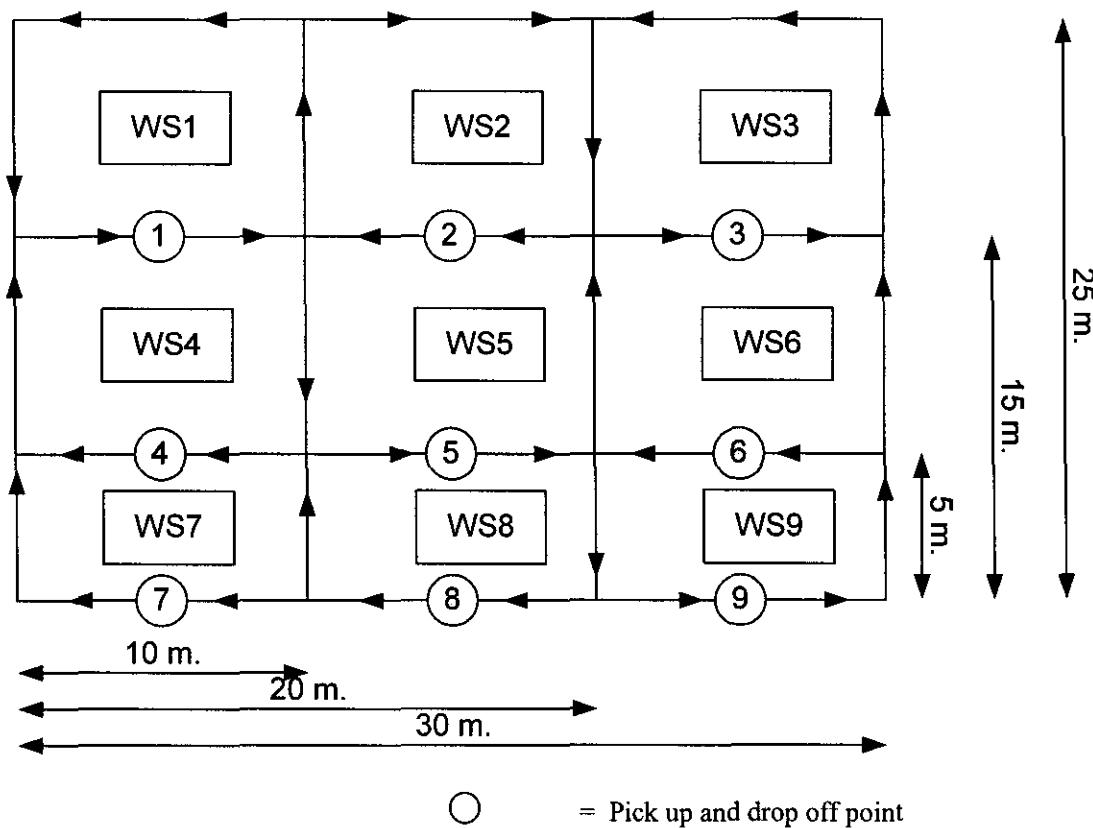
3. What are then meaning and function of EDI and MIS? How are they related to the material flow system? (**10 points**)

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4. In a factory, there are 9 workstations, WS 1, WS 2, WS 3, WS 4, WS 5, WS 6, WS 7, WS 8, and WS 9. There are 4 products, A B C and D, produced in the factory by these 9 workstations. Amount, 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 Fig 2. Material handling capacity of the selected AGV type is 100 kilograms per trip. Its velocity is 2 meter per minute. Its efficiency is 0.8 and it has to be charged the energy after it works for 8 hours (t = 30 minutes). Pick up and drop off time is 0.5 and 0.6 respectively. If there are 10 work hours per day, how many AGV should have in the factory. (use the 2nd case, equation 7.3, from chapter 7 of the book.) **(20 points)**

Table 1 Detail of production
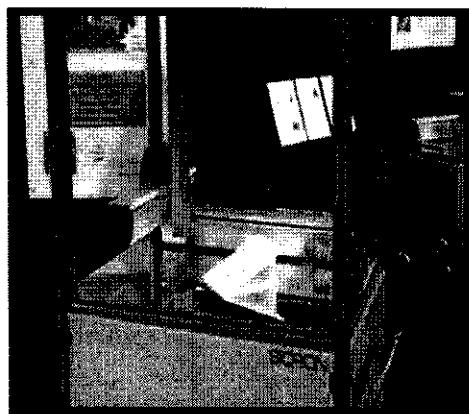
Product type	Production scheduling	Production capacity (parts/day)	Weight (kg.)/ part
A	1→3→4→6→7→9	2,000	0.5
B	2→3→4→5→6→8→9	5,000	0.5
C	1→2→3→4→5→6→7 →8→9	1,000	0.8
D	1→4→5→6→7→8→9	3,000	0.5

○   = Pick up and drop off point

Figure 2 Guide path layout

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5. From Figure 3, what is the type of the robot? What are its appropriate works of the robot (shown in the figure3) ? Give other examples of this robot type.   (**10 points**)

Figure 3.

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6. What is the meaning of AS/RS. Give an example of AS/RS application to the system that you're familiar. **(10 points)**

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7. 7.1 Explain characteristics of these following AS/RS types,　　　　　　　　**(5 points)**

- Unit Load AS/RS

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- Miniload AS/RS

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- Man-on-Board AS/RS หรือ Manaboard AS/RS

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- Automated Item Retrieval System

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- Deep-Lane AS/RS

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7.2 How many components do the AS/RS have? What are they and explain their functions?

(5 points)

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8. Explain functions of these following AGV,   **(10 points)**

      8.1 AGV in the food industry

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      8.2 AGV in the hospital

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      8.3 AGV in the pharmacy industry

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      8.4 AGV in the roll industry

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      8.5 AGV in the AS/RS

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