PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Final Examination : Semester 2 Academic Year : 2008

Date : February 17, 2009 Time : 9.00-12.00

Subject : 226-431 Manufacturing Automation System Room : หัวหุ่นยนต์

Direction

- There are 7 questions. The total score is 80.
- Write your own answer in to the exam paper.
- All materials, books, calculators are allowed.

Assoc. Prof. Wanida Rattanamanee

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

Question	Full Scores	Assigned scores
1	10	
2	10	
3	10	
4	10	
5	10	
6	15	
7	15	
รวม	**80**	

ทุจริตในการสอบ โทษขั้นต่ำ คือ พักการเรียน 1 ภาคการศึกษา และปรับตกในรายวิชาที่ทุจริต

GOOD LUCK

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1. Explain about the material handling system (don't copy from the books or sheets, try to explain from your understanding)

   - Its definition. **(2 points)**

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   - Its advantages **(3 points)**

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   - How can it improve the manufacturing processes ?**(5 points)**

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2. From Figure 1,
   - (Q2.1) explain relationship among quantities of material moved, move distance and material handling types in detail. **(5 points)**
   - (Q2.2) Give one factory example of this relationship application. **(5 points)**

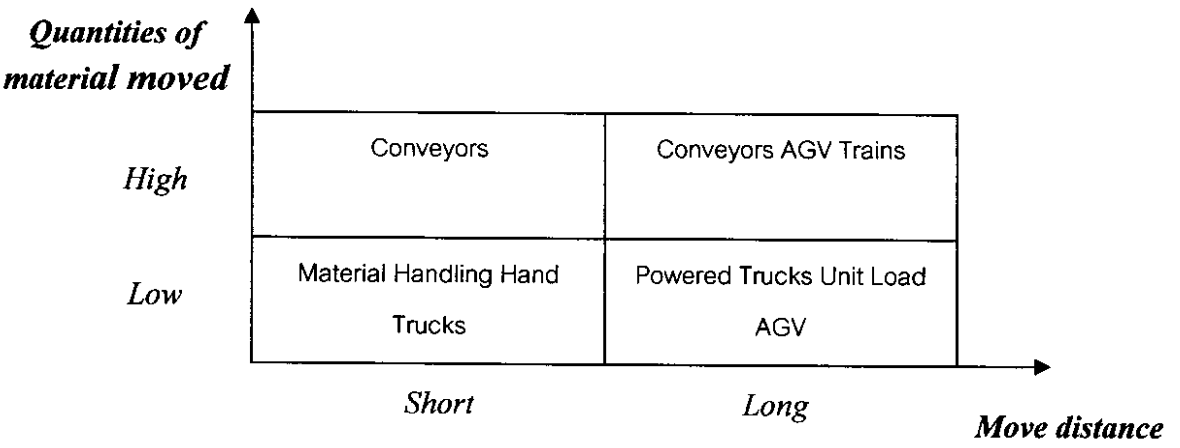

Figure 1 General types of material transport equipment as a function of material quantity and distance moved.

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3. From the 10 principles of material handling, explain Unit Load Principle and System Principle. (**10 points**)

Unit Load Principle .....

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System Principle .....

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4. Explain about AGV
   - Its definition. (**2 points**)

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   - Its advantages (**3 points**)

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- How can it improve the manufacturing processes? (explain in detail or give an example for each improvement.) (**5 points**)

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5. Explain about Automated Storage/Retrieval Systems

- Its definition. (**2 points**)

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- Its advantages (**3 points**)

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- How can it improve the manufacturing processes? (explain in detail or give an example for each improvement.) **(5 points)**

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6. An AS/RS is used for work-in-process storage in a manufacturing facility. The AS/RS has five aisles, each aisle being 120 ft. high. The horizontal and vertical speeds of the S/R machine are 400 ft./min and 50 ft./min, respectively. The S/R machine requires 21 sec. to accomplish a pick-and-deposit operation. The number of single command cycles equals the number of dual command cycles. If the requirement is that the AS/RS must have a throughput rate of 200 S/R transactions/hr. during periods of peak activity, will the AS/RS satisfy this requirement? If so, what is the utilization of the AS/RS during peak hours? **(15 points)**

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7. From the class presentation,

7.1 What is the objective of warehouse management? **(3 points)**

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7.2 What is the objective of FMS? **(3 points)**

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7.3 What is the function of AGV safety area sensor? **(3 points)**

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7.4 What is the theory of Linear Vibratory Conveyors? **(3 points)**

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7.5 What are Lean and Dense Phases? **(3 points)**

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