

**PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING**

Final Examination : Semester I

Academic Year : 2007

Date : October ๗, 2007

Time : 13:30 – 16:30

Subject : 225 - 343 Production Management and Optimization

Room : A400

ทูลริตใการสอบ โทษขัันต่ำปรับตใการวชิขััน และพัการเรียน 1 ภาคการศึกขา

Please read this first!

1. The following materials can be led into examination room :-
 - Lecture notes, handouts, or textbooks.
 - Electronic handheld calculator.
 - Electronic dictionary.
2. All electronic communication equipments (such as PDA phone, mobile telephone, and laptop (notebook) computer) are not allowed.
3. You have to write answers to ALL questions.
4. You have to fill your name and ID on this page and on the top right of the remainder.
5. There are four problems with 40 points.

ชื่อ นาย/น.ส. (ตัวบรรจง)..... นามสกุล

รหัสนักศึกษา

Score (will be filled by lecturer)

Problem no.	Points	Your points
1	10	
2	10	
3	10	
4	10	
	40	

***** This material was prepared by Asst. Prof. Charoen Jaitwijitra *****

1. A firm that produces electric golf carts has just received an order for 200 carts, which are to be ready for delivery at the start of week 8. Information concerning the product structure, lead times, and quantities on hand is shown in the following table.

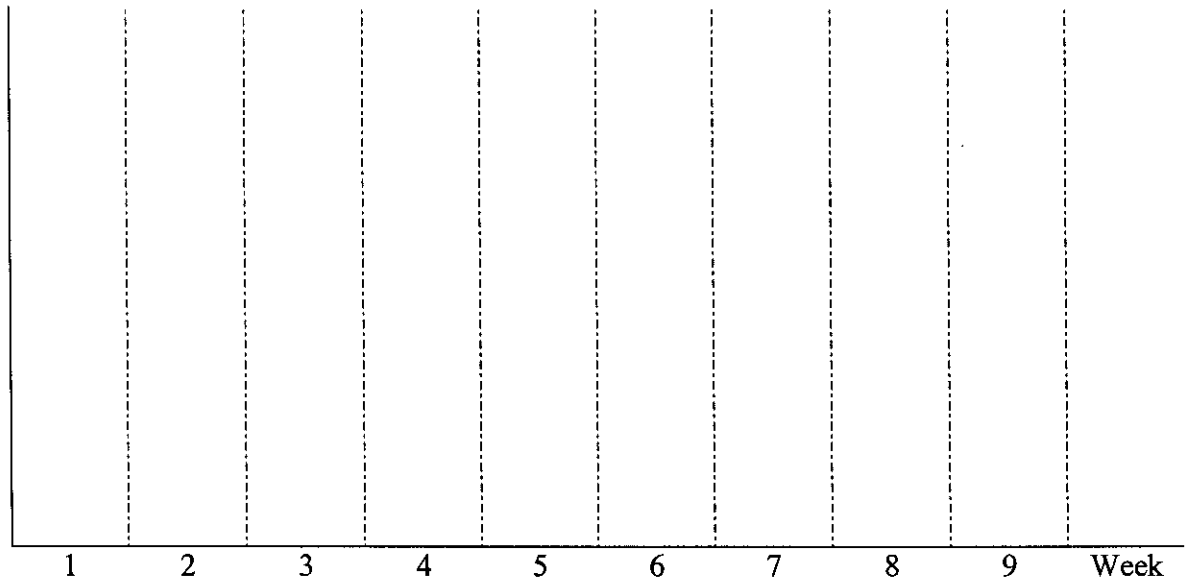
Parts list for electric golf cart	Lead time	Quantity on hand
Electric golf cart	1	0
Top	1	40
Supports (4)	1	200
Cover	1	0
Base	1	20
Motor	2	300
Body	3	50
Frame	1	35
Controls	1	0
Wheel assemblies (4)	1	240
Seats (2)	2	120

Using this information, do each of the following:

- 1.1. (2 points) Construct a product tree.

ชื่อนักศึกษา(เขียนตัวบรรจง ห้ามเขียนรหัสแทนชื่อ).....

1.2. (3 points) Construct an assembly time chart.



ชื่อนักศึกษา(เขียนตัวบรรจง ห้ามเขียนรหัสแทนชื่อ).....

1.3. (5 points) Develop a material requirements plan for Body that will provide 200 golf carts by week 8 assuming lot-for-lot ordering.

Week number:	1	2	3	4	5	6	7	8
Quantity								

Item : Cart LT =week								
Gross requirements								
Scheduled receipts								
On hand								
Net requirements								
Planned-order receipts								
Planned-order releases								

Item : Base LT =week								
Gross requirements								
Scheduled receipts								
On hand								
Net requirements								
Planned-order receipts								
Planned-order releases								

Item : Body LT =week								
Gross requirements								
Scheduled receipts								
On hand								
Net requirements								
Planned-order receipts								
Planned-order releases								

2. (10 points) Use the intuitive technique to develop an initial solution to the following problem. (Note that the total demand and total supply are not equal, the dummy is required.)

From:\nTo:		To:		Supply
		A	B	
1	9	6	75	
2	5	3	75	
Demand	80	90		

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3. (10 points) Solve the following problem using graphical linear programming.

$$\begin{array}{llll} \text{Maximize} & Z & = & 8A + 12B \\ \text{subject to} & 5A + 2B & \geq & 20 \\ & 4A + 3B & \geq & 24 \\ & & & B \geq 2 \end{array}$$

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4. Processing times (including setup times) and due dates for six jobs waiting to be processed at a work center are given in the following tables;

Job	Processing time (days)	Due date (days)
A	2	7
B	8	16
C	4	4
D	10	17
E	5	15
F	12	18

Assume jobs arrived in the order shown above.

4.1. (5 points) Determine the sequence of processing using FCFS rule.

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4.2. (5 points) Determine the sequence of processing using SPT rule.

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