

**PRINCE OF SONGKLA UNIVERSITY**

**FACULTY OF ENGINEERING**

**Final Examination** : Semester I

**Academic Year** : 2009

**Date** : October 4, 2009

**Time** : 13:30 – 16:30

**Subject** : 225 - 343 Production Management and Optimization

**Room** : A201

ทุจริตในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น และพักการเรียน 1 ภาคการศึกษา

**Directions**

1. The following materials can be led into examination room: lecture notes, textbooks, electronic handheld calculator, and dictionary.
2. You have to answers ALL questions.
3. You have to write your name and ID on this page and write only your name on the top-right corner of the remaining pages.
4. There are eight pages (this page is included), four problems with 40 points.

First name Mr./Miss ..... Last name .....

Student ID .....

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

\*\*\*\*\* Asst. Prof. Charoen Jaitwijitra \*\*\*\*\*

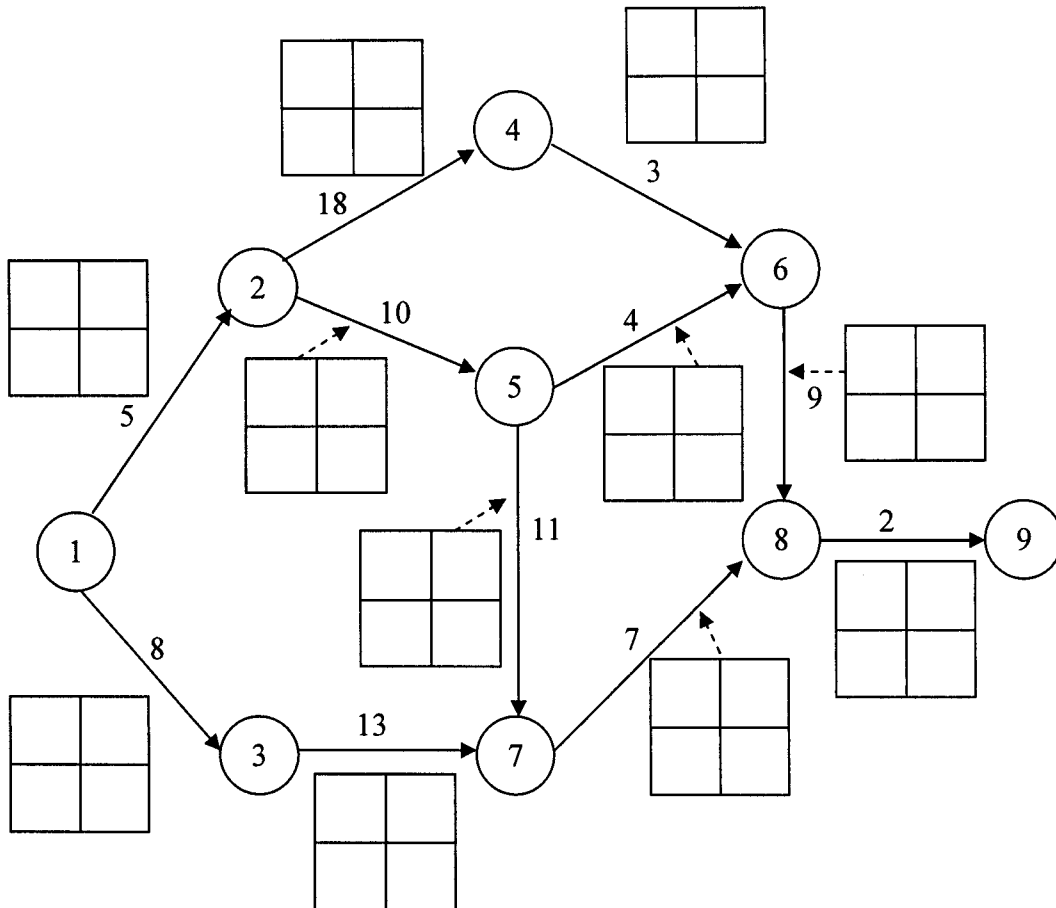


Name (ชื่ออย่างเดียวก ภาษาไทย) .....

Read the problems carefully and write answers in the specified areas under each problem. Don't forget to answer all questions of each problem.

1. ( 10 points ) Determine the critical path and project duration (เวลารวมกี่วัน) using the two pass technique.

ES	EF
LS	LF



Critical path is .....

Project duration = ..... days.

Name (ชื่ออย่างเดียวก ภาษาไทย) .....

2. ( 10 points ) The following table shows four jobs which will pass through process from cutting to turning to grinding *respectively*(ตามลำดับ).

Job names	Processing time (minutes)		
	Saw	Lathe	Grinding machine
A	4	3	5
B	6	8	2
C	2	3	5
D	3	4	8

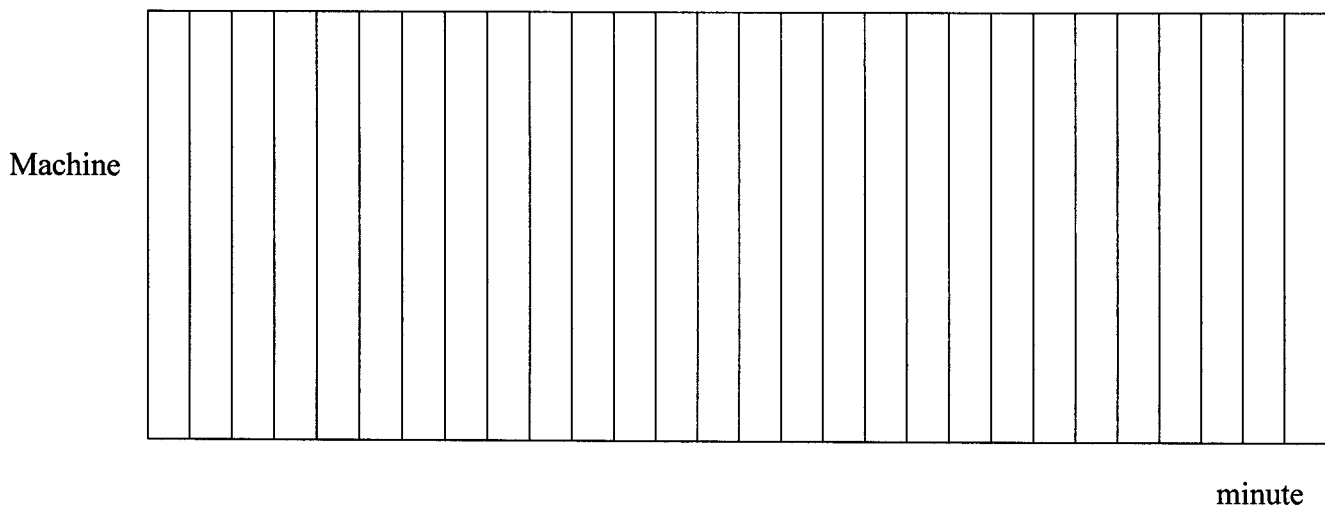
By using the Campbell's rule to arrange jobs, write your answers to the table below.

Job names	k=1		k=2	
	* $t_{i,1}$	* $t_{i,2}$	* $t_{i,1}$	* $t_{i,2}$
A				
B				
C				
D				

When  $k = 1$  the sequence of job is .....

When  $k = 2$  the sequence of job is .....

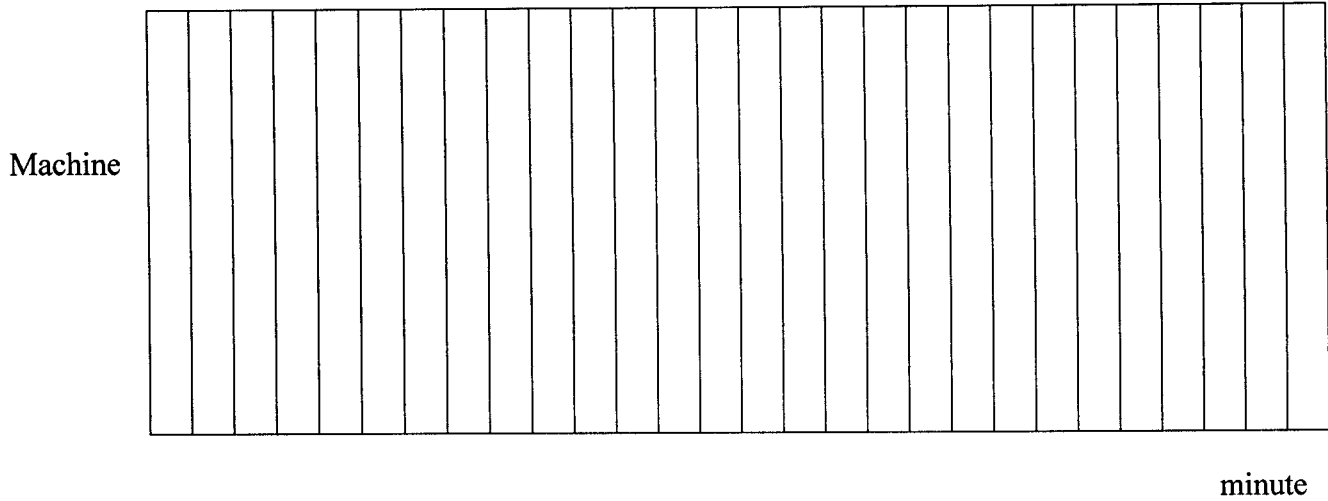
Construct the chart showing the job sequence on the three machines when  $k = 1$



When  $k = 1$  the jobs finished in ..... minutes.

Name (ชื่ออย่างเต็ม ภาษาไทย) .....

Construct the chart showing the job sequence on the three machines when  $k = 2$



When  $k = 2$  the jobs finished in ..... minutes.

Complete table shown below when  $k = 2$ .

Sequence no.	Job name	Processing time (minutes)		Idle time on lathe
		Saw	Lathe	
1				
2				
3				
4				
Total				

Name (ชื่ออย่างเดียวกภาษาไทย) .....

3. ( 10 points ) Use the simplex method to solve the following problem:

$$\begin{array}{llll} \text{Maximize} & Z & = & 8x_1 + 4x_2 \\ \text{subject to} & 5x_1 + 2x_2 & \leq & 50 \\ & 2x_1 + 4x_2 & \leq & 52 \\ & x_1, x_2 & \geq & 0 \end{array}$$



Name (ชื่ออย่างเดียว ภาษาไทย) .....

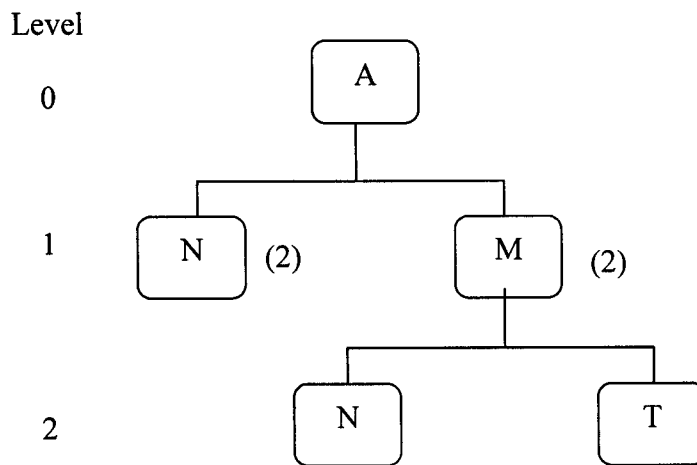
4. ( 10 points ) Consider the bills of materials and item master file data (below) for super widget A. For the master production schedule (MPS) below, compute the planned order releases for super widget A and item M using lot-for-lot lot-sizing rule.

**Master Schedule**

Week	1	2	3	4	5	6	7	8	9	10
Demand	41	44	84	42	84	86	7	18	49	30

**Item Master Data**

Item	Item's Name	Current Inventory	Amount on Order	Week Due	Lead Time (weeks)
A	Widget	120	-	-	2
N	Nut-bolt-washer assembly	300	200	3	2
T	Tubular half-moon pair	140	100	4	2
M	Main module 4	200	100	3	2
			100	7	



หมายเหตุ Amount of order หมายถึง ปริมาณสั่ง  
 Week Due หมายถึง สัปดาห์ที่วัสดุที่สั่งส่งมาถึง เช่น week due = 3 หมายถึงวัสดุที่สั่งจะมาถึงในต้นสัปดาห์ที่ 3

Name (ชื่ออย่างเดียวกภาษาไทย) .....

Item A

Period	1	2	3	4	5	6	7	8	9	10
Gross Requirements										
Scheduled Receipts										
Projected On-Hand										
Net Requirements										
Planned Order Receipts										
Planned Order Releases										

Item M

Period	1	2	3	4	5	6	7	8	9	10
Gross Requirements										
Scheduled Receipts										
Projected On-Hand										
Net Requirements										
Planned Order Receipts										
Planned Order Releases										

