

Name

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Examination : Semester I

Academic Year : 2006

Date : August 4, 2006

Time : 09:00 – 12:00

Subject : 225 - 343 Production Management and Optimization

Room : R201

ทฤษฎีในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น และพักการเรียน 1 ภาคการศึกษา

Directions

1. The following materials can be led into examination room :
 - Lecture notes, handouts, or textbooks.
 - Electronic handheld calculator and Electronic dictionary.
2. Communication equipment such as PDA phone, cellular phone, and laptop (notebook) computer are not permitted.
3. You have to answers ALL questions.
4. You have to fill your name and ID on this page and fill only your name on the top-right corner of the other pages.
5. There are nine pages, seven problems with 40 points.

First name Mr./Miss Surname

Student ID

Score (will be filled by lecturer)

Problem no.	Points	Your points
1	8	
2	5	
3	8	
4	5	
5	5	
6	4	
7	5	
	40	

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

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1. (8 points) Gives the short meaning of the following “words” which are frequently found in this subject (Production Management & Optimization) :

a. Production

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b. Productivity

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c. Manufacturing

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d. Operations management

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2. (5 points) The Thailand Productivity Institute (FTPI) introduces the Thai industries' managers to increase the productivity by manipulate seven factors including Quality, Cost, Delivery, Safety, Morale, Environment, and Ethic. Explain how the morale factor enables to increase the firm's productivity?

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3. A Thai food company has a chain of 12 stores in Songkhla province. Sales and profits for the stores are given in the following table.

Branches	Sales (millions Baht) (A)	Profits (millions Baht) (B)	A*B
1	7	0.15	1.05
2	2	0.10	0.20
3	6	0.13	0.78
4	4	0.15	0.60
5	14	0.25	3.50
6	15	0.27	4.05
7	16	0.24	3.84
8	12	0.20	2.40
9	14	0.27	3.78
10	20	0.44	8.80
11	15	0.34	5.10
12	7	0.17	1.19
Total	132	2.71	35.29

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The regression equation is $\hat{Y} = 0.0506 + 0.01593x$.

- a. (5 points) Compute standard error of estimate ($S_{Y|X}$).

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- b. (3 points) Compute confidence interval for the \hat{Y} when $x = 10$. The confidence level of 99.73% is required and assume $S_{Y|X} = 0.05$.
The z-distribution is used instead of t-distribution.

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4. A small manufacturing firm uses roughly 1500 kilograms of chemical dye a year. Currently the firm purchases 150 kilograms per order and pays 120 Baht per kilogram. The supplier announced that order of 250 kilograms or more will be filled a price of 80 Baht per kilogram. The ordering cost per time is 300 Baht and the firm assigns an annual holding cost of 17 percent of the purchase price per kilogram.

- a. (2 points) Determine the order size that will minimize the total cost.



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b. (3 points) If the supplier offered the discount at 300 kilograms instead of 250 kilograms, what order size would minimize total cost?

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- b. (3 points) What volume would be required per month in order to meet a profit of 30,000 Baht per month (hint: 4 weeks = 1 month)

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6. A firm's manager must decide whether to make or buy a certain item used in the production of vending machines. Cost and volume estimates are as follows:

	Make	Buy
Annual fixed cost	150000 Baht	None
Variable cost/unit	60 Baht	62 Baht
Annual volume (units)	120000	120000

- a. (2 points) Should the firm buy or make this item?

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b. (2 points) There is a possibility that volume could change in the future. At What volume would the manager be indifferent (ไม่แตกต่างกัน) between making and buying?

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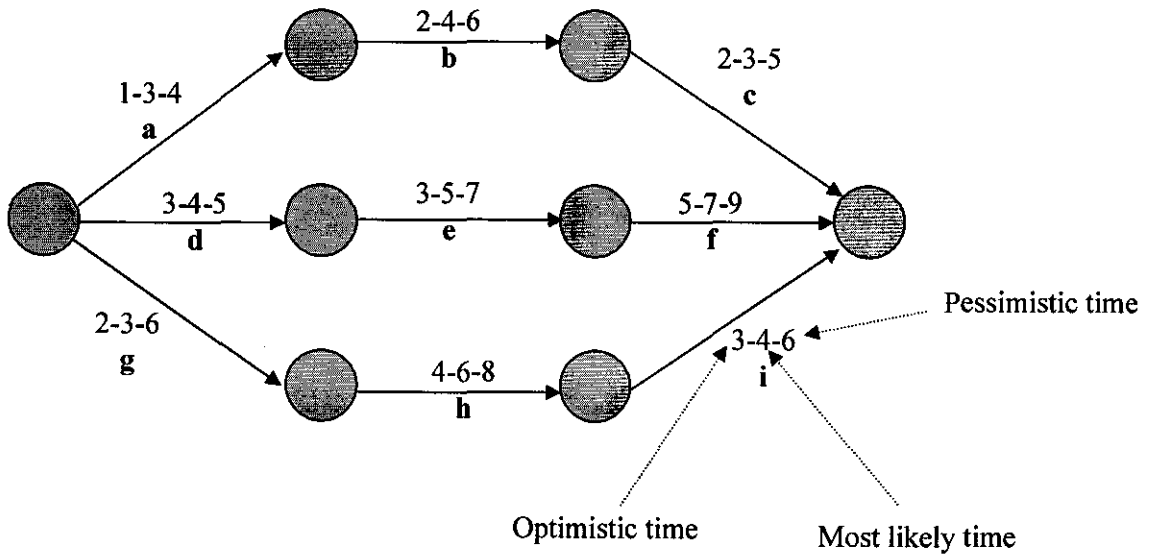
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7. The network diagram for a project is shown below, with three time estimates for each activity.



Activity times are in months. Do the following:

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- a. (2 points) Compute the expected time for each activity and the expected duration (or expected total time) for each part.

Path	Activity	t_o	t_m	t_p	Expected time	Total time for each path
a-b-c	a					
	b					
	c					
d-e-f	d					
	e					
	f					
g-h-i	g					
	h					
	i					

- b. (1 points) Identify the critical path.

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- c. (2 points) Determine the probability that the project can be completed within 17 months of its start. (Hint: this problem requires the standard deviation of the critical path.)

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