

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination: Semester I

Academic Year: 2007

Date: October 1, 2007

Time: 13:30 - 16:30

Subject: 225 - 344 Work Study and Industrial Plant

Room: A201

ทูลจรตใการสอบ โทษจันต่าปรบตคใรยวชานัน และพักการเรยน 1 ภาคการศีกษา

Directions:

1. Lecture notes, textbooks, handheld calculator, and dictionary are permitted to lead into examination room.
2. ALL questions are required answers.
3. You have to fill your name, last name, and ID on this page and fill only your **name** on the top right of all another pages.
4. There are 40 points for this examination.

ชื้อ นาย/น.ส. (เขียนตัวบรรจง) นามสกุล

รหัสนักศีกษา

(This table will be filled score by lecturer)

Questions	points	Your points
1	10	
2	10	
3	5	
4	5	
5	5	
6	5	
	40	

Asst. Prof. Charoen Jaitwijitra



1. The following table shows direct time study using snapback timing technique.

(Unit of time: minutes)

Cycle	Element number			
	1	2	3	4
1	0.15	0.62	0.33	0.51
2	0.14	1.10*	0.20	0.50
3	0.13	0.59	0.36	0.51
4	0.18	0.61	0.37	0.49
5	0.22	0.60	0.30	0.49

* This abnormal time occurred due to the worker went to talked with his supervisor.

Work element number one to three are manual works while number four is done by machine (automatically).

Average performance of the worker is 110% and allowances for 8-hour day work are as the following: personal needs allowance 20 minutes, fatigue allowance 5% of 8 working hours a day.

Compute standard time per cycle.

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ชื่อ (เขียนตัวบรรจง และห้ามกรอกรหัสแทนชื่อ).....

4. The fabrication division of an air-conditioner factory has five press brakes machines (เครื่องพับโลหะแผ่น). Each machine is controlled by a worker.
- 4.1. Compute the interval of idle in percent if there is 33% of idle of these machines with $\pm 5\%$ of actual accuracy.

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- 4.2. These machines were observed by random for 10 times (ถูกสังเกตอย่างสุ่มเวลา 10 ครั้งต่อเครื่อง), the following information are found;
- | | | |
|--------------------------------------|----|---------------|
| Machines were working | 33 | times (ครั้ง) |
| Machines were shut down (ปิดเครื่อง) | 2 | times |
| Machines waited for materials | 15 | times |
- If the manager wants to know the ratio of machine not working with 95.45% of confidence level and $\pm 5\%$ of accuracy, how many observations are required?

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ชื่อ (เขียนตัวบรรจง และห้ามกรอกรหัสแทนชื่อ).....

5. Matching. Next to each definition in column A place the best term (letter only) from column B. The same answer can be used more than once. If no answer then use letter X.

Column A	Questions	Column B
	1. Time for a worker going to drink water	A effective time
	2. Standard time minus allowances =	B ineffective time
	3. Sum of foreign element times =	C observed time
	4. A work element's normal time divides by the rating =	D fatigue
	5. Sum of observed times =	E delay
	6. Time the worker is not working	F check time
	7. Idle machine time due to insufficient operator time to service on or more machines.	G constant element
	8. A lessening in the capacity to work	H normal operator
	9. An operator who can achieve the established standard of performance when following the prescribed method and working at an average pace	I interference time
	10. Time recorded from a watch reading =	J idle time
		K personal needs allowance
		L unaccounted time
		M watch time
		N rating factor
		O standard time
		X none apply

