

Name (Do not enter your ID here!)

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**PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING**

Final Examination: Semester II
Date: 26 February 2008
Subject : 225 - 346 Work Study

Academic Year: 2007
Time: 13:30 - 16:30
Room: R300

ทฤษฎีในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น และพักการเรียน 1 ภาคการศึกษา

Directions:

1. Lecture notes, textbooks, handheld calculator and dictionary are permitted to lead into examination room.
2. You have to fill your name, surname, and ID on this page and fill only your **name** (do not fill your ID) on the top right of the other pages.
3. Pencil is allowed for writing answers.
4. The total score = 50 points.

First name Mr./Miss Last name

Student ID

(Do not write anything in the table)

Question no.	Points	Attainment
1	10	
2	5	
3	5	
4	10	
5	10	
6	5	
7	5	
	50	

Asst. Prof. Charoen Jaitwijitra

2. Compute the confidence level of the work sampling of five copier machines in the XYZ Company. The observer went to observed 500 times and found 150 times of idle. The relative accuracy ± 10 percent is used. *Your answer shall be presented in percent.*

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3. A preliminary study (การศึกษาเบื้องต้น) of 20 readings for a given work element showed that the sample mean = 0.15 minutes and sample standard deviation = 0.09 minutes. If the two tail areas of t-distribution = 10 percent, compute the confidence interval of mean.

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Time Study Observation Form													
Operation : Cut-to-size													
Element No. and Description		1. Set board into vise				2.Saw ends				3.Remove board and stack			
Note	Cycle	R	W	OT	NT	R	W	OT	NT	R	W	OT	NT
	1			55	578	100		60					
	2					100		60		105		60	
	3	110		55		100		60					
	4					100		60		90		80	
Summary													
Total OT													
Rating													
Total NT													
No. of Observations													
Average NT													
Allowance													
Elemental Std. Time													
No. of Occurrences													
Standard Time													
Total Standard Time													

Foreign Elements

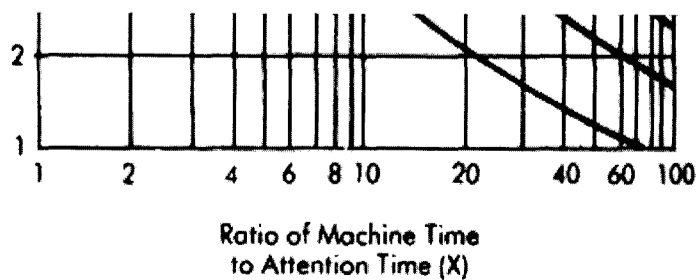
(A) 0.30 min interrupt, check saw blade.

Time Check

Finishing Time		
Starting Time		
Elapsed Time		
TEBS		
TEAF		
Total Check Time		
Effective Time		
Ineffective Time		
Total Recorded Time		
Unaccounted Time		
Recording Error %		

Allowance Summary

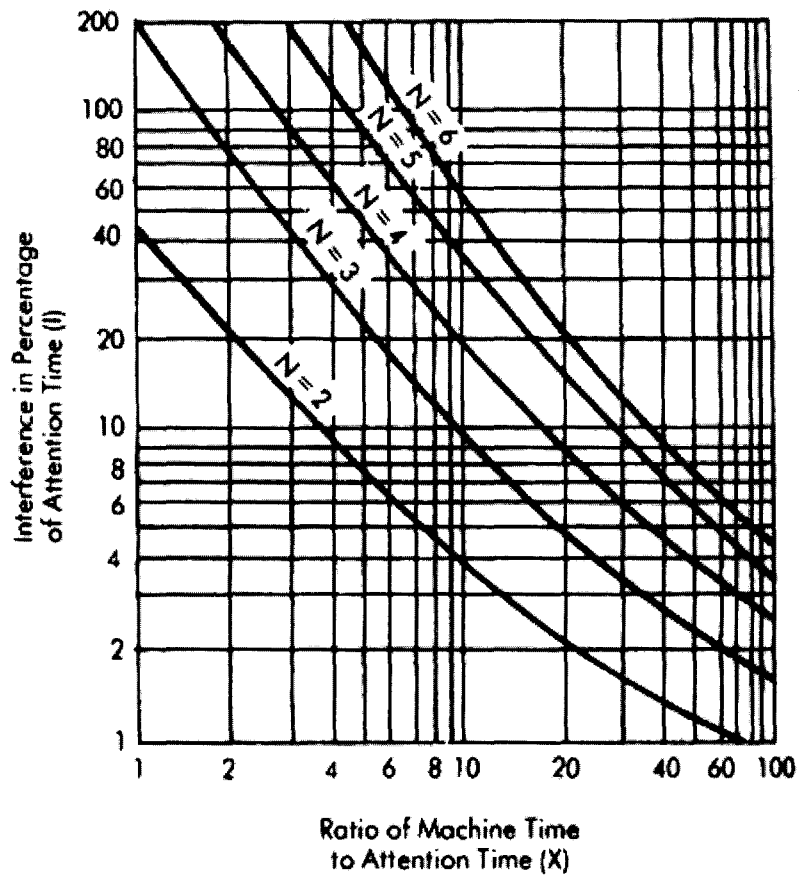
Personal Needs		
Fatigue		
Delays		
Total Allowance %		
Remarks:		



[Handwritten signature]

- 6. If a worker is assigned to control three lathes with the *mean machine running time* = 2.97 minutes (per machine) and the *mean machine attention time* = 0.54 minutes (per machine).

6.1. Use the graph shown below to find the interference value.



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6.2. If the operator is assigned to control four machines, find the X that will keep the same interference value as you answer in the previous question.

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7. Analyze the following activities using the MOST predetermined motion time system. You must write sequence models including the parameter indexes for all questions and also answer how many TMU used for these activities.

7.1. Get a handful (กำมือ) of washers and place on six bolts located 5 inches (12 cm) apart.
(ใส่ washer ลง bolt ทีละตัวจนครบ)

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7.2. A mechanic obtains an *oil dipstick* (ก้านวัดระดับน้ำมันเครื่อง) within reach and places it in to the *engine block* (รูใส่ก้านวัดระดับน้ำมันของเครื่องยนต์) with adjustments while bending.

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