PRINCE OF SONGKLA UNIVERSITY FACULTY OF ENGINEERING

Final Examination: Semester I Academic Year: 2006

Date: October 2, 2006 Time: 9:00 – 12:00

Subject: 226-341 Maintenance Engineering Room: A400

Instructions

Write your name and student ID on the answer book and exam paper.

- Write your answer in the answer book only, show your work clearly and legibly.

This is an opened-book examination.

- There are 12 problems and total score is 120.

Carefully read the problems and answer all questions in each problem.

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Problem (Full score)	Score
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12 (20)	
Total (120)	

Do your best and good luck

Thanate Ratanawilai

_	ain the following items: (15 marks) a. OEE
-	
- t -	o. Predictive Maintenance
	c. Proactive Maintenance
-	
	d. MTTR
	e. MTBF
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. Wha	at are the six big losses of the production line at Haad Thip Co., Ltd? (5 mar

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Name...... ID Code

3.	What is the relationship between 5S activities and maintenance system? (5 marks)

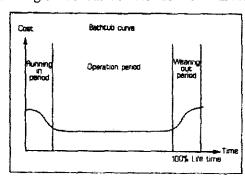
4.	Explain the concept of "Lean Maintenance". (5 marks)

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5. What is the purpose of "Inspection" and what should be included in the standard of "Inspection"? (5 marks)

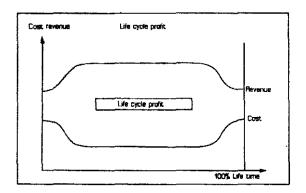
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6. Describes the meaning of "the bathub curb" as shown in the figure below. (5 marks)



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7. Describes "the life cycle profit" as shown in the figure below. (5 marks)



 		
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8. In the furniture industry, a CNC machine is operating at loading time of 8 hours per shift whereas breakdown and set ups time of each day are 0.5 hour and 1.5 hour, respectively. The factory operates 2 shifts a day and produces 600 parts each shift. The capacity of CNC machine is to produce 90 parts per hour. However, the amount defective is 25 parts and the amount re-processes is 20 parts. What is the overall effectiveness for this machine? (20 marks)

9.	What is different between "Periodical Inspection" and Precision Inspection"? (5 marks)
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10. Please construct flow process chart to establish preventive maintenance for

production line of Haad Thip Co., Ltd. (10 marks)

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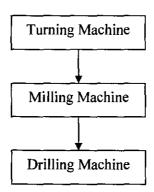
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- 11. If you are a member of the team to establish TPM system for the rubberwood product company. Please answer the following questions. All data can be assumed if necessary. (15 marks)
  - a. How should you recommend the company for starting period?
  - b. Define a TPM policy.
  - c. Design training program for people involved.
  - d. Haw can we measure results of these programs?
  - e. What type of work should they do contract maintenance?



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12. A small production line is established at IE macine shop in order to make a "gear" as a keychain. Three main operations are performed respectively on the following machines;



Construct the preventive maintenance in the given tables by selecting 2 out of the 3 machines above and choosing 3 parts from each selected machine. (20 marks)

## Machine / Equipment Analysis

Machine / Equipment list	Machine charaterization and how to operate	Priority	working continuously / automatically / periodically	Work condition  1. time to operate  2. hour/day	Main part
			-	day/week week/year	

## (MAINTENANCE ANALXSIS-NTBF) Frequeacy and Planning © (4) : Adjustment (1) : Clean $\Delta_{ t L}$ (5) 🕀 : Lubrication - Top up : Repair (2) : Replacement : Lubrication - Replacement 0 : Overhaul (3) : Inspection : Functional Check

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5 - Years Master Plan	(1)	© : Clean	(4) (4) : Adjustment
	(2)	$oldsymbol{\Delta}_{ ext{L}}$ : Lubrication - Top up	(5) 🕀 : Repair
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