

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Final Examination : Semester I

Academic Year : 2007

Date : August 2, 2007

Time : 09:00 - 12:00

Subject : 225 - 344 Work Study and Industrial Plant

Room : R201

ทุจริตในการสอบ 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. You must answers ALL questions.
3. You must fill your name and ID code on this page and fill name on the top-right corner of the other pages.
4. There are 6 problems, total score = 40 points

First name Mr./Miss Last name

Student ID

Problem	points	Your points
1	6	
2	4	
3	10	
4	8	
5	8	
6	4	
	40	

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



1. Answer the following questions:

1.1. (3 points) A potter working eight hours a day produces 400 pots a month using a wood-fired kiln. The total working days are twenty days per month. Compute labor productivity.

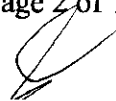
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1.2. (3 points) If the potter changes the method of work (without changing equipment and hours of work), he has able to produce 500 pots a month instead of 400. But he could not sell all 500 pots and has to lower price from 200 Baht a pot to 150 Baht a pot. Compute the productivities **before** and **after** changing the method when unit price are considered as the input of productivity formula.

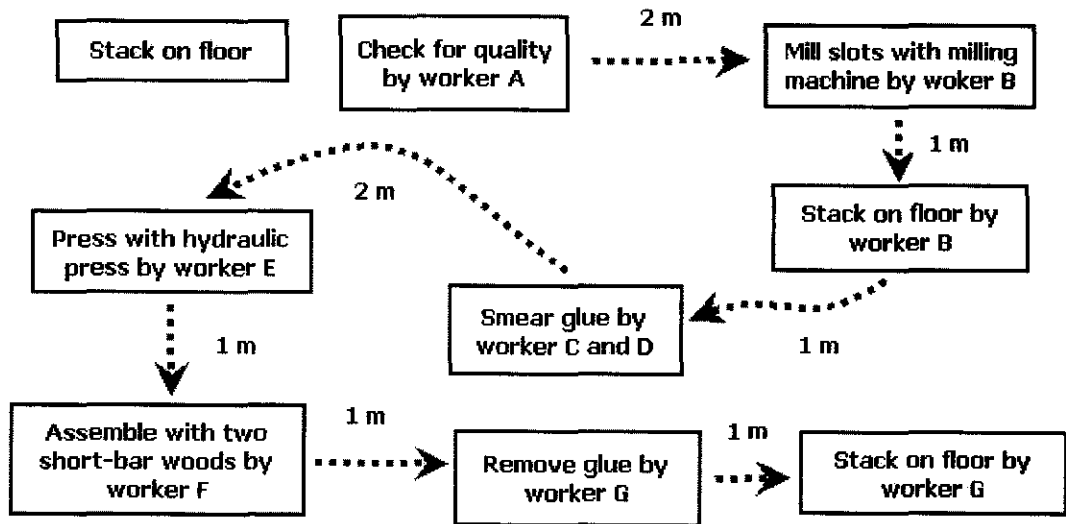
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2. (4 points) Explain the difference between the temporary storage and the permanent storage. Examples of each type of storage should be included.

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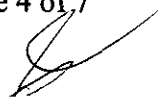


3. (10 points) A wood furniture manufacturing firm producing a product model A123. The manufacturing processes are shown below. The texts above (or under) arrows are distances between adjacent working areas. Construct the material type flow process chart.



Flow Process Chart

Location:							Summary		
							Present	Proposed	Saving
Activity: Method: <i>Present</i> <i>Proposed</i> Type: <i>Worker</i> <i>Material</i> <i>Machine</i>							Operation		
							Transportation		
							Delay		
							Inspection		
							Storage		
							Time (min)		
							Distance (m)		
							Distance (m)	Min.	○



4. (8 points) Choose the words from the following table and fill in the blanks of question 4.1 to 4.4. Each word can be used more than once.

Flow process chart	Two-handed process chart	Multiple activity chart
String diagram	Outline process chart	Flow diagram
Travel chart		

- 1.1. is applied for recording a job sequence by using five symbols including operation, transportation, delay, inspection, and storage.
- 1.2. is commonly used together with flow process chart. It shows the layout and path of movement of the subject. The symbols of flow process chart are also applied to it.
- 1.3. A chart which very useful for recording and analyzing repetitive short cycle jobs. It displays the activities of more than one subject (worker or machine) on a common time scale.
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- 1.4. A tabular record for presenting quantitative data about the movement of workers, materials or equipment between any numbers of places.
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5. (8 points) Give examples of any activities or operations of the following principle of motion economy:

- 5.1. Momentum should be employed to help the worker.
.....
- 5.2. Drop delivery or ejectors should be use whether possible.
.....
- 5.3. Two or more tools should be combined wherever possible.
.....
- 5.4. Gravity feed, bins and containers should be used to deliver the materials as close to the point of use as possible.

6. (4 points) Use the following information to construct an outline process chart:

A typical ball pen compose of many parts as shown in the following table;

Part names	Quantities	Materials
Body	1 piece	Plastic type A
Ink rod	1 piece	Plastic type B
Spring	1 pieces	Steel
knob	1 pieces	Plastic type C

The processes of each part are shown in the following table:

Part names	Process	Time (min.)
Body	1. Plastic injection	1.00
	2. Check quality	0.50
Ink rod	1. Rod forming	2.50
	2. Assemble metallic ball	3.00
	3. Fill ink	2.00
	4. Check quality	0.50
Spring	1. Shape forming	1.00
	2. Check quality	0.50
Knob	1. Plastic injection	1.00
	2. Check quality	0.50

The spring is assembled to body in the first step of assembly. After that the ink rod is inserted to body. The knob is the last work piece which is assembled.

Assembly times are as follow:

Parts	Time (min.)
Body + Spring	0.10
Body + Ink rod	0.10
Body + Knob	0.30