Name _____ Student ID _____

Prince of Songkla University
Department of Industrial Engineering, Faculty of Engineering

Mid Term Examination: Semester 1   Academic Year: 2008
Date: 26 July 2008   Time: 13:30 – 16:30
Subject: 225-716 Comp. Simulation with ProModel   Room: Computer 3

> ทุจริตในการสอบ โทษขั้นต่ำ คือ ปรับตกในรายวิชาที่ทุจริต และพักการเรียนหนึ่งภาคการศึกษา

Instructions: Read carefully
1. All materials are allowed.
2. There are 3 questions. Do all of them. Also show your answer clearly and legibly.
3. Answer the questions in this test paper, only.
4. You must write your name and your student ID in every page of the test.
5. Total score is 100 points.

Distribution of Score

| Problem	Points	Points Gained
1	40	
2	20	
3	40	

Tests are prepared by
Nikorn Sirivongpaisal

Problem 1: (40 points) A very small manufacturing organization receives parts in its storage area and stores them for later use. The parts arrive 5 pieces at a time and are delivered every 40 minutes. There are 10 deliveries during the day. The part moves from the stock area to a conveyor. This move takes 2 minutes. The conveyor moves the part to the start of the machine work area. The part moves from the conveyor to a splitter where the part is worked and turned into 3 parts. The move takes 1 minute. The splitter process takes 5 minutes and the part graphic is changed to show that it has been sawn into 3 pieces. Each part then moves to a lathe or, if the lathe is busy, to a bin. The time to get to the lathe is 2 minutes and the time to the bin is 1.5 minutes. The lathe process lasts 2 minutes. Parts that go to the bin are also taken to the lathe as capacity is available. The move time from the bin to the lathe is 1 minute. Coming out of the lathe, the part graphic is again changed. The part is placed on another conveyor. This move takes 2 minutes. The part moves to the end of the conveyor and then to a final destination where it is prepared for shipping. The move to the final location takes 0.5 minutes. At this final location, 4 parts are accumulated before they receive a last operation that lasts 1 minute and then they leave the shop floor. Develop and run the model. Also answer the following questions.

(a) How long did the model run?

(b) What was the percent of utilization of the splitter and the lathe?

(c) Where were the parts blocked?
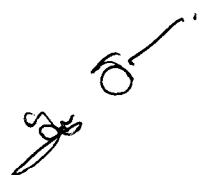
Problem 2: (20 points) The number of prescriptions per day occur in an outpatient drug department. Data shown in Table 1 are those demand sizes on each day collected during 3 months. Identify the appropriate distributions for this set of data. Assume data are independently identically distributed random variables.

Table 1. Demand per day

March		April		May	
	ใบสั่ง		ใบสั่ง		ใบสั่ง
Date	(ใบ)	Date	(ใบ)	Date	(ใบ)
1/3/2006	1,377	3/4/2006	1,407	1/5/2006	1,564
2/3/2006	1,275	4/4/2006	1,452	2/5/2006	1,602
3/3/2006	1,341	5/4/2006	1,494	3/5/2006	1,419
6/3/2006	1,648	7/4/2006	1,510	4/5/2006	1,412
7/3/2006	1,607	10/4/2006	1,540	8/5/2006	1,544
8/3/2006	1,343	11/4/2006	1,606	9/5/2006	1,675
9/3/2006	1,263	12/4/2006	1,444	10/5/2006	1,553
10/3/2006	1,145	17/4/2006	1,634	15/5/2006	1,584
13/3/2006	1,443	18/4/2006	1,713	16/5/2006	1,581
14/3/2006	1,441	20/4/2006	1,657	17/5/2006	1,419
15/3/2006	1,196	21/4/2006	1,656	18/5/2006	1,561
16/3/2006	1,281	24/4/2006	1,597	19/5/2006	1,610
17/3/2006	1,233	25/4/2006	1,562	22/5/2006	1,539
20/3/2006	1,632	26/4/2006	1,641	23/5/2006	1,536
21/3/2006	1,583	27/4/2006	1,566	24/5/2006	1,423
22/3/2006	1,479	28/4/2006	1,433	25/5/2006	1,394
23/3/2006	1,344			26/5/2006	1,436
24/3/2006	1,251			29/5/2006	1,587
27/3/2006	1,588			30/5/2006	1,557
28/3/2006	1,512			31/5/2006	1,359
29/3/2006	1,413				
30/3/2006	1,590				
31/3/2006	1,309				

Problem 3: (40 points) Refer to problem 5 (Raja & Rani Restaurant) on page 502 in your textbook. Model this system and also answer the questions (a), (b), (c), and (d).