Prince of Songkla University

Department of Industrial Engineering, Faculty of Engineering

Midterm Examination: Semester 1 **Academic Year: 2010**

Date: 3August 2010 **Time: 09:00 – 12:00**

Subject: 225-348 Operation Research **Room: S817**

ทุจริตในการสอบ โทษขั้นต่ำ คือ พักการเรียน 1 ภาคการศึกษา และปรับตกในรายวิชาที่ทุจริต

ข้าพเจ้าจะซื่อสัตย์ในการสอบ

Name_____ **Surname**_____ **Student ID**_____

Instructions: Read carefully

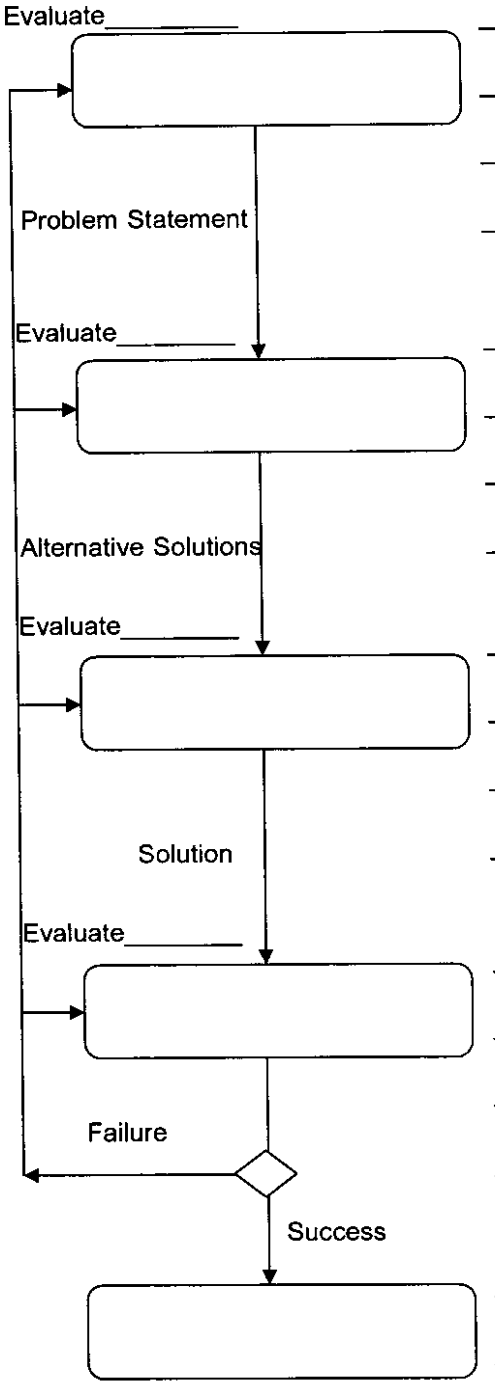
1. Materials allowed are;

   ☑ A4 paper 3 sheet. ☑ Dictionary ☑ Calculator
2. There are 4 problems (7pages), do all of them. Also show your work 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 40 points.

Distribution of Score

Problem	Points	(1)	(2)	(3)	(4)
1	10	-	-	-	-
2	10	3	4	3	-
3	10	3	3	2	2
4	10	3	3	2	2

Problem 1 Explain decision making process of Simon's Model and give the example of the decision situation by step. (10 points)



(2 points)

(2 points)

(2 points)

(2 points)

(2 points)

Problem 2 Photoinfo magazine vender sells magazine at the shop in Diana department store. Fortnightly vender must determine how many magazine to order. The shop pays the Photoinfo magazine company 20 baht for each volume and sells magazine for 25 baht. Photoinfo magazine that are unsold at the end of fortnightly are worthless. The shop knows that fortnightly demand can sell between 6 and 10 volumes, with each possible being equally likely. Please find this problem. (10 points)

Table 1: Rewards for Photoinfo magazine vender

Photoinfo magazine order	Photoinfo magazine demand				
	6	7	8	9	10
6	30 B	30 B	30 B	30 B	30 B
7	10 B	35 B	35 B	35 B	35 B
8	-10 B	15 B	40 B	40 B	40 B
9	-30 B	-5 B	20 B	45 B	45 B
10	-50 B	-25 B	0 B	25 B	50 B

2.1) For each action, determine the worst outcome (smallest reward). Find out the Maximin Criterion chooses? (3 points)

The shop of department store in Diana should order Photoinfo magazine _____volumes.

2.2) For each action, determine the best outcome (largest reward). Find out the Maximin Regret Criterion chooses? (4 points)

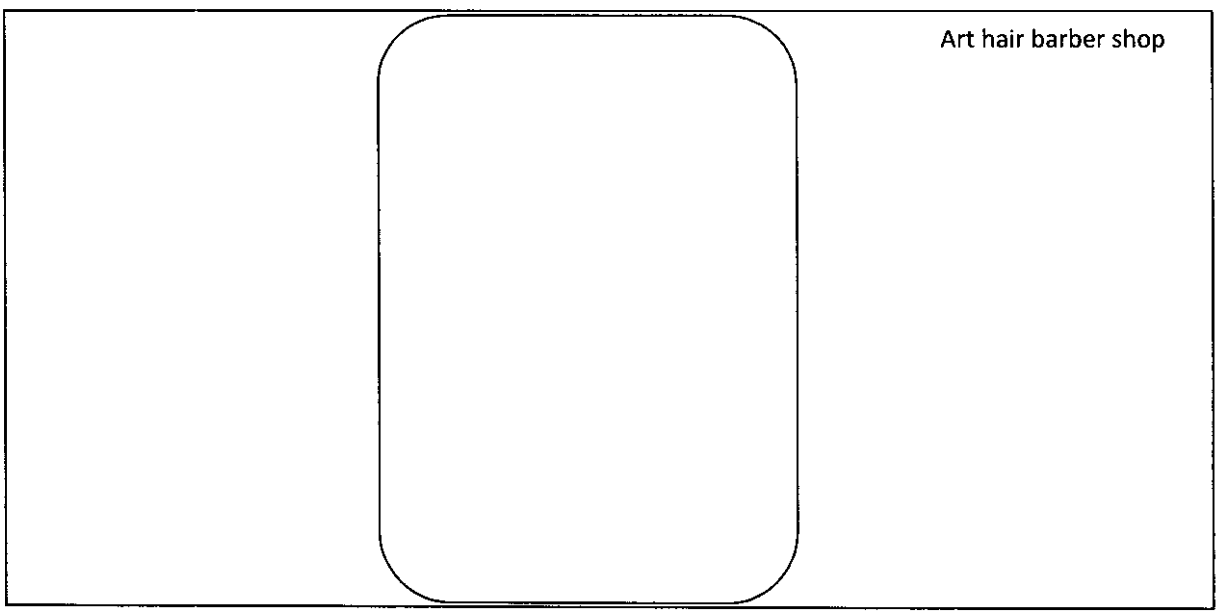
The shop of department store in Diana should order Photoinfo magazine _____volumes.

2.3) Find out the expected value criterion chooses the action that yields the largest expected reward. (3 points)

The shop at Diana department store should order Photoinfo magazine _____volume and the largest expected reward _____baht.

Problem 3 Art hair barber shop has a total of 3 seats. Interarrival time is exponentially distributed, and an average of 9 prospective customers arrives each hour at the shop. Those customers who find the shop full do not enter. The barber takes an average of 12 minutes to cut each customer's hair and first come first service. Haircut time is exponentially distributed. (Assumption: Steady-State Measure of Performance.) (10 points)

3.1) Fitting the system model of Art hair barber shop. (3 points) __/__/__



Arrival Rate =_____ Service Rate=_____

3.2) What is the probability that exactly none of customer in the shop? (3 points)

3.3) How many average haircuts/hour will be completed by barber? (2 points)

3.4) How much average time will be spent by a customer who entry in the shop? (2 points)