

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination: Semester II

Academic Year: 2006

Date: December, 22 2006

Time: 9:00-12:00

Subject: 225-384 Fundamental of Engineering Statistics

Room: R200/R201

Instructions

- Write your answer in the paper exam only, show your work clearly and legibly.
- Write your name and student ID on every page of the paper exam.
- This is an opened-book examination.
- There are 7 problems and total score is 105.
- Carefully read the problems and answer all questions in each problem.

ทฤษฎีในการสอบ โทษขั้นต่ำ คือ พักการเรียน 1 ภาคการศึกษา และปรับตกในรายวิชาที่ทฤษฎี

Problem#	Score	Assigned score
1	25	
2	10	
3	10	
4	15	
5	15	
6	10	
7	20	
Total	105	

Good Luck

Thanate Ratanawilai



1. An experiment involves tossing a pair of dice, one green and one red, and recording the numbers that come up. (25 marks)
 - 1.1 List the elements of the sample space S .
 - 1.2 List the elements of S corresponding to event A that the sum is less than 5.
 - 1.3 List the elements of S corresponding to event B that a 6 occurs on either die.
 - 1.4 List the elements of S corresponding to event C that a 2 comes up on the green die.
 - 1.5 Construct a Venn diagram to show the relationship among the events A , B , C , and S .



2 A coin is biased so that a tail is twice as likely to occur as a head. If the coin is tossed three times, what is the probability of getting exactly two tails? (10 marks)

3 Find the probability that a person flipping a coin gets the third head on the seventh flip. (10 marks)

A handwritten signature in black ink, consisting of a stylized, cursive letter 'S' followed by a horizontal line extending to the right.

- 4 One bag contains four white balls and three black balls, and a second bag contains three white balls and five black balls. One ball is drawn from the first bag and placed unseen in the second bag. What is the probability that a ball now drawn from the second bag is black? (15 marks)

- 5 Suppose that on the average 1 person in 1000 makes a numerical error in preparing their income tax returns. If 10,000 forms are selected at random and examined, find the probability that 6, 7, or 8 of the forms will be error. (15 marks)



6 If X, Y, and Z have the joint probability density function (10 marks)

$$f(x, y, z) = kxy^2z \quad 0 < x < 2, 0 < y < 1, 0 < z < 1$$
$$= 0 \quad \text{elsewhere}$$

6.1 Find k.

6.2 Find $P(X < 1/4, Y > 1/2, 0 < Z < 2)$



- 7 If a set of grades on a statistics examination are approximately normal distributed with a mean of 74 and a standard deviation of 7.9, find (20 marks)
- 7.1 The lowest passing grade if the lowest 10% of the students are given F's.
 - 7.2 The highest B if the top 5% of the students are given A's.

