**Probability and Statistics – Quiz 2 (6/2/2015)**

**(試卷請隨答案卷繳回)**

**Name: ID:**

1. Normal distribution

(a) Please describe the five properties of the normal distribution curve. [20%]

(b) The heights of 1000 students are normally distributed with a mean of 174.5 centimeters and a standard deviation of 6.9 centimeters. Assuming that the heights are recorded to the nearest half-centimeter, how many of these students would you expect to have heights between 171.5 and 182.0 centimeters inclusive? [20%]

1. (a) Please find the moment-generating function of the binomial random variable X. [10%]

(b) Please use (a) to verify that μ=np and σ2=npq. [15% for each answer]

1. Suppose that, on average, 1 person in 1,000 makes a numerical error in preparing his or her income tax return. If 10,000 returns are selected at random and examined, find the total probability that 6, 7, or 8 of them contain an error. [20%]

Note:

1. Please find out probability values using the attached tables whenever possible.

2. Please specify the probability distribution you use to find your answers.

3. Please explain/justify the condition to use any approximation.