

### **MA4704 Tutorial for Week 6 : Normal Probability Distributions**

**Question 1:** Use the Murdoch Barnes Tables to compute each of the following.

(Recall the complement, symmetry and interval rules).

- |      |                  |       |                            |
|------|------------------|-------|----------------------------|
| I.   | $P(Z \geq 1.26)$ | V.    | $P(Z \leq 2.01)$           |
| II.  | $P(Z \geq 0.62)$ | VI.   | $P(Z \leq -1.28)$          |
| III. | $P(Z \geq 2.40)$ | VII.  | $P(Z \leq -1.12)$          |
| IV.  | $P(Z \leq 1.28)$ | VIII. | $P(1.04 \leq Z \leq 1.82)$ |

**Question2:** The lifetime of an electrical component is known to follow a normal distribution with a mean of 2,000 hours and a standard deviation of 200 hours.

Compute the probability that a randomly selected component will last

1. more than 2,220 hours,
2. between 2,000 and 2,400 hours.

#### **Question 3**

The amount of time required for routine automobile transmission service is normally distributed with the mean 45 minutes and the standard deviation 8.0 minutes.

The service manager plans to have work begin on the transmission of a customer's car 10 min after the car is dropped off, and the customer is told that the car will be ready within 1 hour total time (i.e. after the car is dropped off).

What is the probability that the service manager will be wrong?

#### **Question 4: MA4704 Spring 2007/2008 : Question 2**

- (a) Assume that the length of injected moulded plastic components are normally distributed with a mean of 10mm and a standard deviation of 2mm. Draw a rough sketch and then calculate corresponding probability for the following measurements occurring on an individual component:
- (i) Between 10 and 12.4mms
  - (ii) Less than 9.7 mms
  - (iii) Between 9.8 and 10.1 mms
  - (iv) Less than 10.3 mms