Sample Paper 7: Paper 2

Question 8 (40 marks)

Question 8 (a)

The parameter in this question is the mean glass thickness, μ.

Null hypothesis H_0: $\mu = 0.954$ cm

Alternative hypothesis H_A: $\mu \neq 0.954$ cm

(This is called a two-tailed test as the glass should not be too thick or too thin.)

Question 8 (b)

Mean $\mu = 0.954$ cm

Mean of sample $\bar{x} = 0\cdot96$ cm

Standard deviation $\sigma = 0.13$ cm

Number of sample $n = 100$

$z = ?$

$$z = \frac{\bar{x} - \mu}{\left(\dfrac{\sigma}{\sqrt{n}}\right)}$$

$$z = \frac{0\cdot96 - 0\cdot954}{\left(\dfrac{0\cdot13}{\sqrt{100}}\right)} = 0\cdot46$$

Question 8 (c)

$p = 2P(z > 0\cdot46)$

$\quad = 2\{0\cdot5 - (0\cdot6772 - 0\cdot5)\}$

$\quad = 2\{1 - 0\cdot6772\}$

$\quad = 0\cdot6456 \gg 0\cdot05$ [0.05 = 5% level of significance]

Therefore, the probability of the null hypothesis is very, very strong. We accept the null hypothesis.

Question 8 (d)

The glass company does not have sufficient evidence to conclude it is not meeting the specifications. The difference between the sample mean and the actual mean is not large enough to attribute to anything but sampling error.