

LC 2013 (SET D): PAPER 2

QUESTION 2 (25 MARKS)

Question 2 (a) (i)

$$X = 68$$

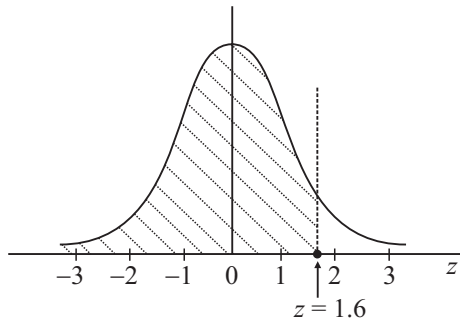
$$\mu = 60$$

$$\sigma = 5$$

$$z = ?$$

$$z = \frac{X - \mu}{\sigma} = \frac{68 - 60}{5} = 1.6$$

$$P(X \leq 68) = P(z \leq 1.6) = 0.9452$$



FORMULAE AND TABLES BOOK
Statistics and Probability: Probability distribution (standardising formula) [page 34]

$$z = \frac{x - \mu}{\sigma}$$

n = Number in the sample

σ = standard deviation of the sample

MARKING SCHEME NOTES

Question 2 (a) (i) [Scale 10C (0, 3, 8, 10)]

- 3: • Any relevant step
 • Formula written
- 8: • Reference to 1.6
 • Incorrect reading of tables

Question 2 (a) (ii)

$$X = 52$$

$$\mu = 60$$

$$\sigma = 5$$

$$z = ?$$

$$z = \frac{X - \mu}{\sigma} = \frac{52 - 60}{5} = -1.6$$

$$P(52 \leq X \leq 68)$$

$$= P(-1.6 \leq z \leq 1.6)$$

$$= P(z \leq 1.6) - P(z \leq -1.6)$$

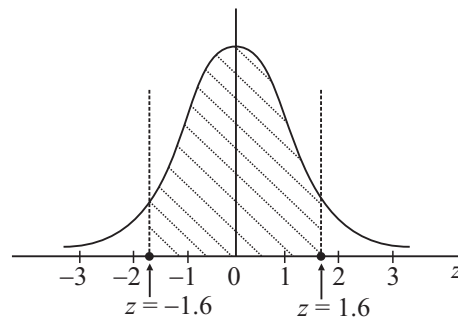
$$= P(z \leq 1.6) - P(z \geq 1.6)$$

$$= P(z \leq 1.6) - [1 - P(z \leq 1.6)]$$

$$= 2P(z \leq 1.6) - 1$$

$$= 2(0.9452) - 1$$

$$= 0.8904$$



MARKING SCHEME NOTES

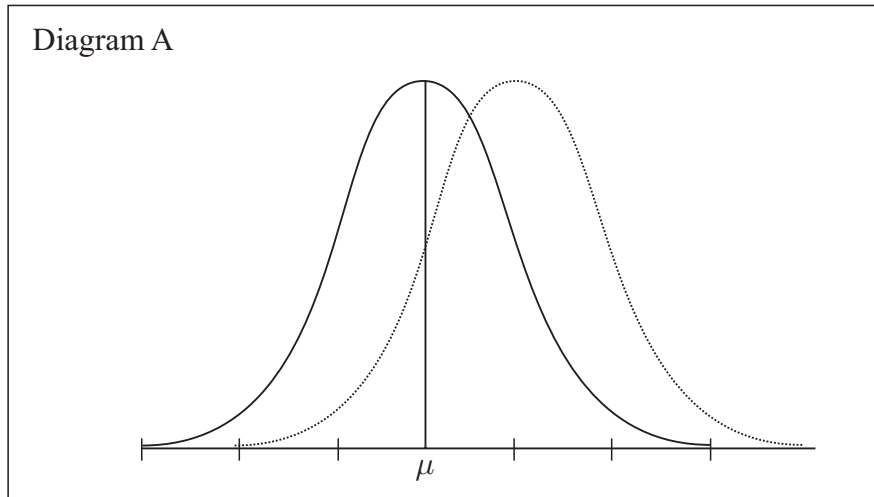
Question 2 (a) (ii) [Scale 5C (0, 3, 4, 5)]

- 3: • Any relevant step other than in a (i)
 • Diagram clearly indicating a 'new' area
 • Reference to -1.6
 • $P(Z \leq -1.6) = 0.0548$ and stops
- 4: • Probability of both situations calculated but fails to finish correctly
 • Correct method with some error

Question 2 (b)

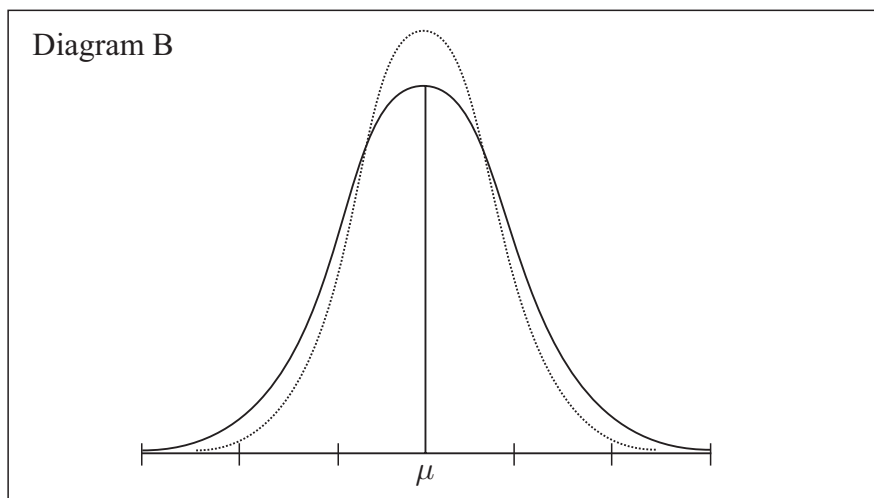
Hormone A

The effect of hormone A was to increase the height of all of the plants.



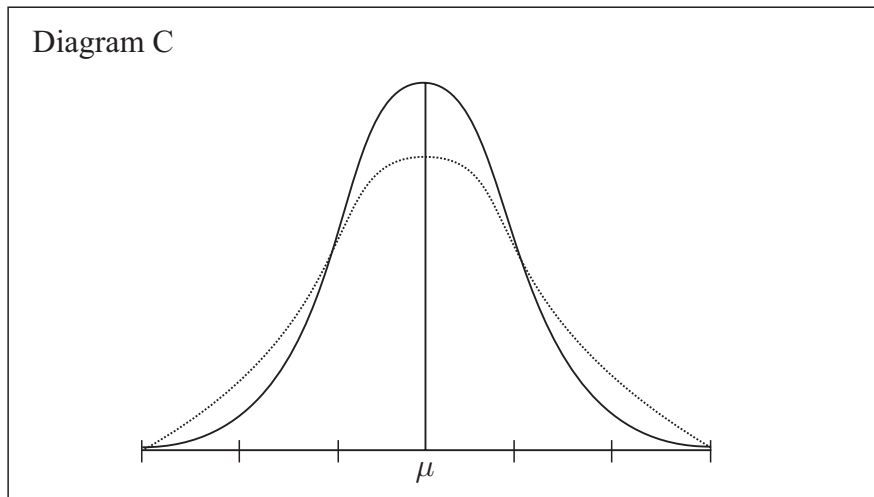
Hormone B

The effect of hormone B was to reduce the number of really small plants and the number of really tall plants. The mean was unchanged.



Hormone C

The effect of hormone C was to increase the number of small plants and the number of tall plants. The mean was unchanged.



MARKING SCHEME NOTES

Question 1 (b) [Scale 10C (0, 3, 8, 10)]

- 3:**
- One correct
 - Bell shape in one or more
- 8:**
- Two correct