

| Question Number | Answer | Acceptable answers | Mark |
|-----------------|--------------|-----------------------------------|------------|
| 1(a)(i) | 8-10 (hours) | accept any value between 8 and 10 | (1) |

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|-----------------|--|---|------------|
| 1(a)(ii) | (85/100) x 500 (1) Or (500/100) x 85 (1) 425 (plants) | award two marks for correct bald answer | (2) |

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|------------------|---|--|------------|
| 1(a)(iii) | plant can flower all year round/flowering not limited to one period of the year/plant can flower for longer/flower at any time. | ignore references to growing accept pollination for flowering | (1) |

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|-----------------|-------------------------|--------------------|------------|
| 1(a)(iv) | C photoperiodism | | (1) |

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| 1(b)(i) | less likely to be eaten (by animals / herbivores) | accept kills pests/reduces damage done by pests reject predators | (1) |

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| 1(b)(ii) | <p>An explanation linking two of the following:</p> <p>the bamboo mutated to produce cyanide (1)</p> <p>or</p> <p>bamboo plants that produced cyanide survived to reproduce/ increase in numbers/increase in size (1)</p> <p>and</p> <p>mutation in greater bamboo lemur allowed them to tolerate cyanide (1)</p> <p>or</p> <p>greater bamboo lemurs get more food so survive to breed/reproduce (more) (1)</p> | <p>accept some bamboo plants have the {gene/allele} to produce cyanide</p> <p>ignore bamboo plants not eaten</p> <p>accept lemurs have {gene/allele} to tolerate cyanide</p> <p>ignore {adapted to tolerate/resistant to} cyanide</p> <p>accept lemurs have less competition for food</p> | (2) |

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| 1(c)(i) | A aggression | | (1) |

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| 1(c)(ii) | <p>An explanation linking two of the following:</p> <p>sounds can be heard over a long distance /heard in the dark (1)</p> <p>do not need to have visual contact/allows communication with more animals (1)</p> <p>or</p> <p>more different types of sound (1)</p> <p>more {emotions/ behaviour/ information} can be conveyed (1)</p> | <p>accept quicker communication method</p> <p>accept doesn't require good vision</p> | (2) |

(Total for question 1 = 11 marks)

| Question number | Answer | Additional guidance | Mark |
|-----------------|--|---|------------|
| 2(a)(i) | <p>$29 \div 500 = 0.058$ (1)</p> <p>$0.058 \times 100 = 5.8$ (1)</p> | award full marks for correct numerical answer without working | (2) |

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|-----------------|---|------|
| 2(a) (ii) | An explanation that combines identification via a judgment (1 mark) to reach a conclusion via justification/reasoning (1 mark): <ul style="list-style-type: none"> • compost B (1) as it has the highest percentage water retained • and there is a higher amount of water loss in the plants due to higher temperatures causing a {larger rate of evaporation of water/higher transpiration rates} (1) | (2) |

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|-----------------|---|---------------------------------------|------|
| 2(a) (iii) | Use the same starting mass of compost (1) | accept any other relevant improvement | (1) |

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|-----------------|---|--|------|
| 2(b) (i) | An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> • by reducing the water content it reduces the number of microorganisms that can reproduce (1) • because there is a reduction of microorganisms this reduces the decay process/preserves the food (1) | accept bacteria/pathogens for microorganisms | (2) |

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|-----------------|----------------------------------|------|
| 2(b) (ii) | to kill unwanted micro-organisms | (1) |

(Total for question 2 = 8 marks)

| Question number | Answer | Additional guidance | Mark |
|-----------------|---|---|------------|
| 3(a)(i) | $25 \times 25 = 625$ (1) $1 \div 625 = 0.0016$ (1) | award full marks for correct numerical answer without working | (2) |

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|-----------------|---|------------|
| 3(a)(ii) | An answer that combines points of interpretation/evaluation to provide a logical description: <ul style="list-style-type: none"> as light intensity decreases the rate of photosynthesis also decreases (1) after 20 cm away when light intensity appears to have little effect on the rate of photosynthesis (1) | (2) |

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|------------------|-----------------------------|------------|
| 3(a)(iii) | use a light meter/lux meter | (1) |

| Question number | Answer | Additional guidance | Mark |
|-----------------|--|--|------------|
| 3(a)(iv) | An explanation that combines identification – improvement of the experimental procedure (1 mark) and justification/reasoning which must be linked to the improvement (1 mark): <ul style="list-style-type: none"> collect the gas/oxygen produced in a graduated gas syringe (1) to reduce the errors generated when counting bubbles which maybe of different sizes (1) | accept alternative gas collection method with measuring cylinder and beehive shelf accept leave the apparatus for a longer amount of time | (2) |

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| 3(b) | An explanation that combines identification via a judgment (1 mark) to reach a conclusion via justification/reasoning (1 mark): <ul style="list-style-type: none"> the volume of gas produced would decrease to below four bubbles (1) because light is needed for photosynthesis (1) | (2) |

(Total for question 3 = 9 marks)