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Mark Scheme (Results)
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GCSE

360Science

GCSE Additional Science B2 (5016H/1H)

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USING THE MARK SCHEME

1. This mark scheme gives you;
   * an idea of the type of response expected
   * how individual marks are to be awarded
   * the total mark for each question
   * examples of responses that should not receive credit.
2. ; separates points for the award of each mark.
3. / means that the responses are **alternatives** and either answer should receive full credit.
4. ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
6. OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
7. 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
8. 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
9. ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

1. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
2. **Do not** award marks for repetition of the stem of the question.
3. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

1. In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

Question Number	Answer	Mark
1 (a)	mitosis;	**(1)**

Question Number	Answer	Mark
1 (b)	Any two from: 1. wound sealed / healed / scab formed; 2. mass / ball of cells; 3. (which are) undifferentiated; 4. stem cells / no Hayflick limit; 5. **cells** grow / regenerate / mitosis / divide; 6. differentiate / examples; [Ignore cells grow larger]	**(2)**

Question Number	Answer	Mark
1 (c)	re-grow human limbs / cheaper compared to prosthetics/ better chance of survival if injured/ produce stem cells / must relate newt gene to GM;	**(1)**

Question Number	Answer	Mark
2 (a)	photosynthesis; [Reject respiration]	**(1)**

Question Number	Answer	Mark
2 (b)	Any two from: 1. idea that percentage of carbon dioxide is not affected (significantly) by a nearby plant/ a tree / enough carbon dioxide to go around; [Ignore lots of carbon dioxide] 2. air movement/ wind means air constantly changing; 3. replaced by respiration / trees make carbon dioxide / decomposition / combustion;	**(2)**

Question Number	Answer	Mark
2 (c) (i)	Any two from: 1. sample the soil (under the tree); 2. test nitrate concentrations / levels; 3. link range to test; 4. research what typical nitrate levels are in soil (using books / internet);	**(2)**

Question Number	Answer	Mark
2 (c) (ii)	temperature / carbon dioxide levels / water levels / light intensity / other mineral levels / pH / colour or green-ness of plant / density of grass plants in the pots / length or surface area of roots; [Ignore width of stem / dry mass / wet mass]	**(1)**

Question Number	Answer	Mark
3 (a)	all points plotted correctly +/- half a small square; deduct one mark for each incorrectly plotted point; suitable line of best fit;	**(2)** **(1)**

Question Number	Answer	Mark
3 (b)	Any two from: 1. at the **top** of the fermenter the pH remains steady / at the bottom the pH is **more** varied; 2. at the **bottom** of the fermenter as the speed increases the pH falls; 3. credit accurate or detailed description of pupil line e.g. levels off after 40; 4. pH at bottom never falls as low as pH at the top of the fermenter; 5. credit correct manipulation of figures;	**(2)**

Question Number	Answer	Mark
3 (c)	to ensure optimum conditions throughout the whole of the fermenter (for the micro organisms) / stops settling / reduces settling / stops or reduce areas where cells die;	**(1)**

Question Number	Answer	Mark
4 (a)	less (fossil) fuels/ containing sulphur being burnt / smokeless zones / idea of more efficient scrubbing / cleaning of sulphur dioxide / **switching** to renewable energy;	**(1)**

Question Number	Answer	Mark
4 (b)	lichen diversity increases / it increases / more **types** of lichen;	**(1)**

Question Number	Answer	Mark
5 (a)	50 X 19; 950(m^3);	**(1)** **(1)**

Question Number	Answer	Mark
5 (b)	Any two from: 1. light intensity lower (on mars); 2. colder (for algae); 3. leakage of oxygen from biosphere; 4. other organisms may get in;	**(2)**

Question Number	Answer	Mark
5 (c)	Any two from: 1. not seasonal; 2. rapid population growth / wheat grows slowly; 3. easily manipulated; 4. uses up waste, e.g. nitrates more effectively; 5. no need for soil/eq; 6. less waste (e.g. straw) after harvesting / less space used / ORA;	**(2)**

Question Number	Answer	Mark
5 (d)	(solar panels generate electricity) for heat / warmth / increased light levels for **more** photosynthesis / enzymes working faster; **OR** provide light at night so photosynthesis goes on for **longer**;	**(1)**

Question Number	Answer	Mark
6	Any five from: 1. DNA splits (along a small length) / unwinds / unzips; [Ignore A-T] 2. complimentary base pairs match up; 3. (m)RNA made; 4. (m)RNA leaves nucleus; 5. (m)RNA lies on/attaches to ribosomes; 6. triplets/codons; 7. anticodons pair up; 8. (t)RNA specific to amino acids; [Reject wrong RNA] 9. amino acids joined together; 10. by enzyme (e.g. protein synthetase); [Credit transcription or/and translation if used correctly]	**(5)**
	TOTAL FOR PAPER: 30 MARKS	