Mark Scheme (Results)

Pearson Edexcel

Additional Sample Assessment Materials
GCSE 9-1
Paper 1: Biology 1BI0/1F

First examination 2017

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Summer 2017

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Additional SAMs Paper 1F Foundation

Question number	Answer	Mark
1(a)	C	(1)

Question number	Answer	Mark
1(b)	• pathogens (1) • antibiotics (1) • viruses (1)	(3)

Question number	Answer	Mark
1(c)	An answer that combines knowledge (1 mark) and understanding (2 marks) to provide a logical description: • white blood cells (1) • produce antibodies (1) • memory lymphocytes/cells produced (that provide immunity) (1)	(3)

Total for Question 1 = 7 marks

Question number	Answer	Additional guidance	Mark
2(a)	pH heading in one column (1) Time in minutes heading in separate column (1) Correct range of pH values under heading pH (1)	Full marks for table with two rows or columns, one for pH (with values) and other for time in minutes.	**(3)**

Question number	Answer	Additional guidance	Mark
2(b)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via reasoning (1 mark): • Milk will turn colourless more quickly at pH8 (1) • As this is nearest to the optimum pH for trypsin (1)	Accept other correct data	**(2)**

Question number	Answer	Mark
2(c)	**B**	**(1)**

Question number	Answer	Additional guidance	Mark
2(d)(i)	• An answer between 35^{o}C and 40^{o}C	Ignore 'body temperature'	**(1)**

Question number	Answer	Mark
2(d) (ii)	• (thermostatically controlled) water bath / incubator	**(1)**

Total for Question 2 = 8 marks

Question number	Answer	Mark
3(a) (i)	An answer that combines points of interpretation to provide a logical description: • more fertiliser used in 2013 (1) • increased by 162 million tons/correct interpretation of data from the graph (1)	(2)

Question number	Answer	Additional guidance	Mark
3(a) (ii)	• Increase in (world) population/more crops needed for food	Accept other valid reasons	(1)

Question number	Answer	Mark
3(b) (i)	• 4:52 (1) • 52 ÷ 4 = 1:13	(2)

Question number	Answer	Mark
3(b) (ii)	eutrophication /leading to algal bloom/death of aquatic life/animals/fish/oxygen depletion (in water) (1)	(1)

Total for Question 3 = 6 marks

Question number	Answer	Mark
4(a) (i)	• suitable scale (1) • axes labelled (1) • bars plotted correctly (1)	(3)

Question number	Answer	Mark
4(a) (ii)	**A**	(1)

Question number	Answer	Additional guidance	Mark
4(a) (iii)	An answer that combines the following points to provide a logical description of the method: • crush the seeds to release the sugar (1) • add Benedict's solution and heat (gently) (1) • brick-red colour (indicates presence of reducing sugar) (1)	Accept: other correct methods	(3)

Question number	Answer	Additional guidance	Mark
4(a)(iv)	wear safety goggles (to prevent chemicals getting into eyes)/heat mixture in a waterbath(1)	Accept other suitable precautions Ignore wear gloves Accept other correct safety precautions	(1)

Question number	Answer	Additional guidance	Mark
4(b)	• 42 (1) • X 85 % = 35.7 (g)	Award full marks for correct numerical answer without working Allow 36 for full marks	(2)

Total for Question 4 = 10 marks

Question number	Answer	Mark
5(a)	B	(1)

Question number	Answer	Additional guidance	Mark
5(b)(i)	An answer that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks): • same concentration to prevent water moving into/out of the cell (1) • by osmosis (1) • which would cause cell damage/cells could not be used in transfusions(1)	Accept description of change in cells e.g. cells will burst	(3)

Question number	Answer	Mark
5(b) (ii)	An answer that provides a description by making reference to: • place the cells in a range of solutions of different concentrations(1) • determine the mass/diameter of cells before and after placing in solutions(1) • use the concentration where there is no net movement into and out of the cells (1)	(2)

Question number	Answer	Mark
5(b) (iii)	To check results/compare with previous results/results of other scientists	(1)

Question number	Answer	Mark
5(b) (iv)	Infection/transmission of pathogen	(1)

Question number	Answer	Mark
5(b) (v)	wear gloves/do not directly handle the blood/tissue	(1)

Total for Question 5 = 9 marks

Question number	Answer	Mark
6(a)	An answer that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • (onions) are found in the soil/underground so they do not have access to sunlight (1) • Because they contain no chloroplasts to absorb sunlight (1)	(2)

Question number	Answer	Mark
6(b) (i)	**D**	(1)

Question number	Answer	Mark
6(b) (ii)	20mm = 20 000 µm (1) (20 000 ÷ 100) = 200 X	(2)

Question number	Answer	Mark
6(b) (iii)	An answer that provides a description by making reference to two of the following points: • growth of new root/plant cells (1) • repair (plant/root) tissue (1) • development of roots to absorb water / minerals /for anchorage (1)	(2)

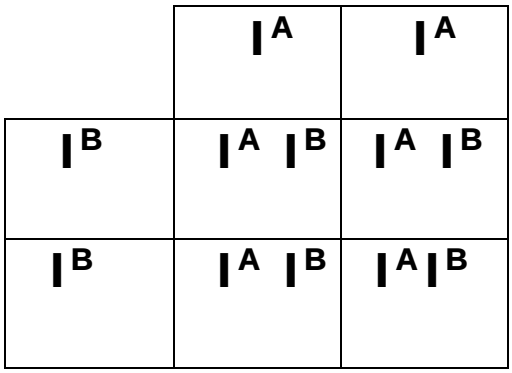
Question number	Answer	Additional guidance	Mark
6(c)(i)	• 70% (1) • 16.8 hr (x60) (1) • 1008 (min)	Allow full marks for correct final answer	(3)

Question number	Answer	Mark

6(c) (ii)	An answer that provides a description by making reference to: • normal cell processes / cell metabolism (1) • DNA replication/DNA is copied (1)	**(2)**

Total for Question 6 = 12 marks

Question number	Answer	Mark
7(a)	• alleles (1) • codominant (1)	**(2)**

Question number	Additional guidance	Mark
7(b)	 1 mark for correct parental gametes (1) 1 mark for correct offspring (1)	**(2)**

Question number	Answer	Mark
7(c)	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification - application of understanding (1 mark): • each parent carries a recessive/O allele (1) • offspring inherit two recessive/O alleles (1)	**(2)**

Question number	Answer	Additional guidance	Mark
7(d)(i)	1400 x 47 (1) 65800 ÷ 100 = 658	Award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Mark
7(d) (ii)	Any one from: • transmission of infection • ethical issues/religious beliefs	**(1)**

Question number	Answer	Mark
7(e)	An explanation that combines identification - knowledge (1 mark) and reasoning/justification -understanding (1 mark): • if a large number of individuals in a population are immune/immunised (1) • transmission of the disease is limited (1)	**(2)**

Total for Question 7 = 11 marks

Question number	Answer	Mark
8(a)	cannot be transferred from one person to another	**(1)**

Question number	Answer	Additional guidance	Mark
8(b)	An answer that combines points of interpretation to provide a logical description: • number of deaths increase with age after the age of 21 (1) • valid interpretation of data/information from graph(1)	Allow increase after age between 20 and and 23	**(2)**

Question number	Answer	Additional guidance	Mark
8(c)	Any one from: • mammals may be harmed • drugs may affect other mammals in a different way(1)	other mammals systems work in a different way from humans	**(1)**

Question number	Answer	Additional guidance	Mark
8(d) (i)	**C**		**(1)**

Question number	Indicative content	Mark
8(d) (ii)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via reasoning (2 marks): • male Q (1) • higher BMI / less exercise / higher fat intake (1) • so more risk of fatty deposits / plaques in arteries / atherosclerosis / restricted blood flow to heart (1)	(3)

Question number	Answer	Mark
8(e)	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification - application of understanding (2 marks): • stent inserted into blood vessel and is expanded (1) • stent opens /widens blood vessel (1) • greater blood flow (through blood vessel) (1) • more oxygen delivered to body organ (1)	(3)

Total for Question 8 = 11 marks

Question number	Answer	Additional guidance	Mark
9(a)	• to produce more food (1) • to improve quality of food (1)	bigger plants , produce more kernels, more sweet/juicy, pest resistant,	**(2)**

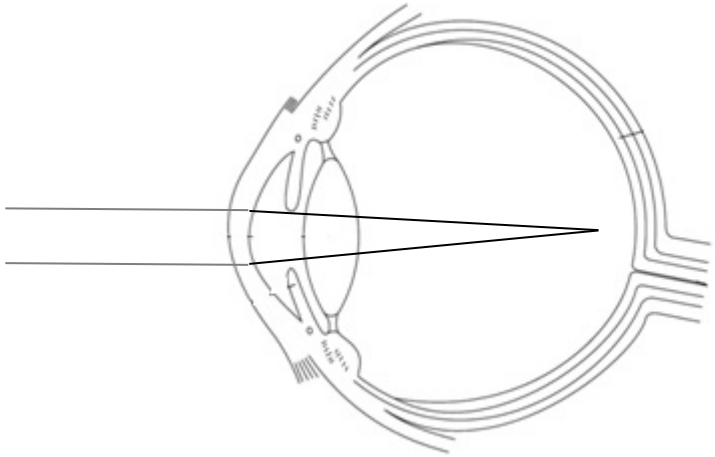
Question number	Answer	Additional guidance	Mark
9(b)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • best characteristics/named characteristic chosen (1) • parents bred together (1) • offspring produced showing some of the best characteristics are selected (1) • selection and breeding process repeated (1)	accept reference to pollination / fertilisation	**(3)**

Question number	Answer	Mark
9(c)	An answer that provides a description by making reference to: • an extra/new gene (1) • present in the DNA/chromosome (1)	**(2)**

Question number	Indicative content	Mark
***9(d)**	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are therefore not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 (6 marks)** **Similarities:** • both selective breeding and genetic engineering change characteristics of corn • both selective breeding and genetic engineering produce useful characteristics in corn **Differences:** • selective breeding has to be carried out repeatedly but genetic engineering is carried out once • offspring of corn produced by selective breeding may not show the desired characteristics but offspring of genetically engineered plants will show the desired characteristics • genetically engineered seeds are more expensive to purchase • genetic engineering requires more specialist equipment • there are objections to use of genetically engineered crops	**(6)**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3–4	• Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

Total for question 9 =13 marks

Question number	Answer	Mark
10(a)(i)	 the rays converging (1) rays meeting at a point before the retina (1)	(2)

Question number	Answer	Mark
10(a)(ii)	An explanation that combines application of knowledge (1 marks) and reasoning/justification – application of understanding (1 mark): • laser used to reshape the cornea/lens (1) • so that light rays are refracted on to the retina (1)	(2)

Question number	Answer	Mark
10(a)(iii)	B	(1)

Question number	Answer	Mark
10(bi)	A description that combines analysis via a judgement (1 mark) to reach a conclusion (1 mark): • as the caffeine dosage increases from 100mg to 300mg mean reaction time decreases (1) • little / no further effect on reaction time above 300mg dosage (1)	**(2)**

Question number	Indicative content	Mark
***10 (bii)**	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are therefore not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO2 (6 marks)** • cone cells are receptor cells • found in the retina • cone cells detect colour • volunteers unable to distinguish between red and green • red and green cone cells defective • red and green cone cells not stimulated by light • colour change on screen will not be seen • volunteers will not react / hit the button when screen changes colour	**(6)**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. • Lines of reasoning are unsupported or unclear (AO2)
Level 2	3–4	• The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. • Lines of reasoning mostly supported through the application of

		relevant evidence (AO2)
Level 3	5–6	• The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the context of the question. • Lines of reasoning are supported by sustained application of relevant evidence (AO2)

Total for Question 10 = 13 marks