Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE

In Biology (5BI3F) Paper 01

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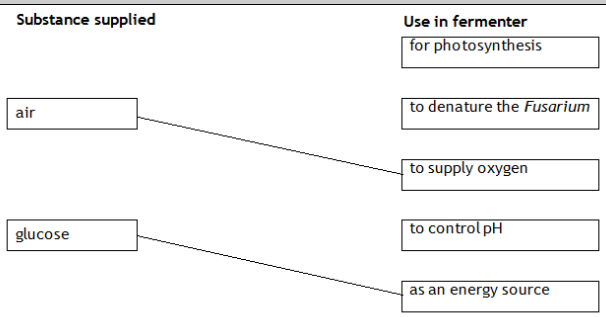
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General Marking Guidance

- 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.

Question number	Answer	Acceptable answers	Marks
1 (a) (i)		Reject if two lines from same box	(2)

Question number	Answer	Marks
1 (a) (ii)	Aseptic (techniques)	(1)

Question number	Answer	Acceptable answers	Marks
1 (a) (iii)	An explanation linking to control the temperature/provide optimum conditions (1) for maximum growth of *Fusarium* / to prevent microorganisms being killed/prevent enzymes denaturing (1)	Keep constant, not too hot, doesn't overheat	(2)

Question number	Answer	Marks
1 (a) (iv)	**B** Fungus **The only correct answer is B** ***A** is not correct because Fusarium is a eukaryote and not prokaryotic* ***C** is not correct because Fusarium is saprophytic* ***D** is not correct because Fusarium is a eukaryote and not a virus*	(1)

Question number	Answer	Marks
1 (b)	A suggestion including the following: • pH decreases / becomes more acidic (1) • lactic acid (is produced) (1)	(2)

Total for question 1 = 8 marks

Question number	Answer	Marks
2 (a) (i)	**A** daily cycle **The only correct answer is A** ***B*** *is not correct because a week is 7 days* ***C*** *is not correct because a month is longer than a day* ***D*** *is not correct because a year is not 24 hours long*	(1)

Question number	Answer	Acceptable answers	Marks
2 (a) (ii)	instinctive(1)	inherited, does not need to be learned	(1)

Question number	Answer	Acceptable answers	Marks
2 (b)	A suggestion to include the following: warmer in south (1) killed by cold (1)	 colder in north to breed/feed	(2)

Question number	Answer	Acceptable answers	Marks
2 (c) (i)	(10+9+2) ÷ 3 7	 two marks for correct answer	(2)

Question number	Answer	Acceptable answers	Marks
2 (c) (ii)	population is decreasing (1)	Ignore restating the data do not accept fluctuation of data / calculation of data without clarification	(1)

Total for question 2 = 7 marks

Question number	Answer	Acceptable answers	Marks
3 (a) (i)	584 000 * 0.9 (1) 525 600	Two marks for correct answer Accept other valid methods	(2)

Question number	Answer	Marks
3 (a) (ii)	cases not reported/causes of death unknown / named example	(1)

Question number	Answer	Acceptable answers	Marks
3 (b) (i)	A description including the following less children who are given immunisation get malaria (1) use of manipulated data (1)	 half as many develop malaria / 16% vs 8%	(2)

Question number	Answer	Marks
3 (b) (ii)	**B** antigen **The only correct answer is B** ***A** is not correct because a lymphocytes do not form part of the immunisation* ***C** is not correct because the injection is an action and cannot stimulate antibody production* ***D** is not correct because inoculation is the act of immunizing and does not in itself lead to antibody production*	(1)

Question number	Answer	Acceptable answers	Marks
3 (c)	Any two from Concerns over side effects / allergic reactions (1) Afraid of needles (1) Against religious beliefs (1) Unable to afford it (1)	 Concerns it causes illness ethics	(2)

Question number	Answer	Acceptable answers	Marks
3 (d)	An explanation including the following; produce chemicals (1) to kill/deter pathogen (1)	 named chemical resist pathogen accept named pathogen / predator/ herbivore	(2)

Total for question 3 = 10 marks

Question number	Answer	Marks
4 (a)	**A** bacterium **The only correct answer is A** ***B*** *is not correct because Agrobacterium tumefaciens is a prokaryote* ***C*** *is not correct because Agrobacterium tumefaciens does not show any of the characteristics of a plant* ***D*** *is not correct because Agrobacterium tumefaciens is a prokaryote and is not a virus*	(1)

Question number	Answer	Acceptable answers	Marks
4 (b) (i)	A description to include three of following; bacteria multiply (1) used to infect the (tomato) plant / as a vector (1) transfer the gene to the tomato plant DNA (1) produces a callus /tumour (1) culturing of transgenic/purple tomato plantlets (1)	Accept crown gall	(3)

Question number	Answer	Acceptable answers	Marks
4 (b) (ii)	An explanation to include two of the following; EITHER flavonoids are antioxidants /good for health (1) example of health benefit (reduce cancer risk)(1) OR improve appearance (1) (so) more people buy them/ more profit	 Accept 'look different/unusual' Accept 'so children will eat them'	(2)

Question number	Answer	Marks
4 (c)	Explanation linking: (herbicides) do not affect/kill corn (1) kills weeds (1) less competition for space / mineral ions / light /water (1)	(2)

Question number	Answer	Marks
4 (d)	A description to include; biological controls (1) release (large numbers of) ladybirds into crop (1) ladybirds eat corn borers so (1) less corn eaten less damage to crop (by corn borer) (1)	(3)

Total for question 4 = 11 marks

Question number	Answer	Marks
5 (a)	**C** imprinting **The only correct answer is C** ***A** is not correct because conditioning responses are learnt over time* ***B** is not correct because habituation results in suppression of an action* ***D** is not correct because training involves repeated stimuli*	(1)

Question number	Answer	Marks
5 (b)	An explanation linking: goslings follow their mother (1) with two of the following: don't get lost (1) goslings learn skills needed to survive (1) (mother provides) protection (1) (mother takes them) to food (1)	(3)

Question number	Answer	Marks
5 (c)	An explanation linking: preventing predators attacking offspring (1) put their own life at risk (1)	(2)

Question Number		Indicative Content	Mark
QWC	***5d**	A explanation to include some of the following points classical conditioning • linking a neutral stimulus (e.g. whistling) with innate behaviour (e.g. chasing sheep) • repetition • conditioned reflex • results in learning e.g. dogs herding sheep in response to whistle operant conditioning • accidental event e.g. dog scares the sheep to move • positive reinforcement as reward • negative reinforcement as punishment • repetition • results in learning e.g. dogs herding sheep	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• A limited explanation of either classical conditioning or operant conditioning • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• A simple explanation of both classical conditioning and operant conditioning or a detailed description of one • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• A detailed explanation of both classical conditioning and operant conditioning • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total for question 5 = 12 marks

Question number	Answer	Acceptable answers	Marks
6 (a) (i) (ii)	menstruation (1) ovulation (1)	period egg release	(2)

Question number	Answer	Acceptable answers	Marks
6 (a) (iii)	oestrogen (1) progesterone (1)	accept answers in any order FSH / follicle stimulating hormone (1) LH / luteinising hormone (1)	(2)

Question number	Answer	Marks
6 (a) (iv)	**A** fertilization **The only correct answer is A** ***B*** *is not correct because germination occurs in plants* ***C*** *is not correct because immunization involves a response of the immune system* ***D*** *is not correct because sterilization is part of aseptic technique in the removal of microorganisms*	(1)

Question number	Answer	Acceptable answers	Marks
6 (a) (v)	allow implantation (of embryo)	maintains pregnancy	(1)

<table>
<tr><th colspan="2">Question Number</th><th>Indicative Content</th><th>Mark</th></tr>
<tr><td>QWC</td><td>*6b</td><td>A explanation to include some of the following points

Sperm:<table><tr><th>structure</th><th>function</th></tr><tr><td>tail</td><td>mobility</td></tr><tr><td>acrosome</td><td>enzymes/entry to egg</td></tr><tr><td>mitochondria</td><td>Energy (to move)</td></tr><tr><td>haploid nucleus</td><td>For fertilisation/ to produce diploid zygote</td></tr></table>
Egg<table><tr><th>structure</th><th>function</th></tr><tr><td>Cell membrane</td><td>Changes after entry of sperm</td></tr><tr><td>Round shape</td><td>Allows easy movement</td></tr><tr><td>Haploid nucleus</td><td>For fertilisation/ to produce diploid zygote</td></tr><tr><td>cytoplasm</td><td>Store of nutrients</td></tr><tr><td>Zone/wall around egg</td><td>Protection of egg</td></tr></table></td><td>(6)</td></tr>
<tr><td>Level</td><td>0</td><td colspan="2">No rewardable content</td></tr>
<tr><td>1</td><td>1 - 2</td><td colspan="2">• A simple explanation of a structure and a function of either egg or sperm
• the answer communicates ideas using simple language and uses limited scientific terminology
• spelling, punctuation and grammar are used with limited accuracy</td></tr>
<tr><td>2</td><td>3 - 4</td><td colspan="2">• A limited explanation of a structure and a function of egg or sperm AND a limited explanation of a structure or function of the other
• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately
• spelling, punctuation and grammar are used with some accuracy</td></tr>
<tr><td>3</td><td>5 - 6</td><td colspan="2">• A detailed explanation of the structures and function of egg and sperm
• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately
• spelling, punctuation and grammar are used with few errors</td></tr>
</table>

Total for question 6 = 12 marks

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