



Mark Scheme (Results)

January 2021

Pearson BTEC Nationals
In Animal Management (31644H)
Unit 1: Animal Breeding and Genetics

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Unit 1: Animal Breeding and Genetics

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark grids should be applied positively. Learners must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark grid, not according to their perception of where the grade boundaries may lie.
- All marks on the mark grid should be used appropriately.
- All the marks on the mark grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks, if the learner's response is not rewardable according to the mark grid.
- Where judgement is required, a mark grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the mark grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The mark grids have been designed to assess learners' work holistically.

Rows in the grids identify the assessment focus/outcome being targeted. When using a mark grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner's response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

Question Number	Answer	Mark
1 (a)	<ul style="list-style-type: none"> • Scent marking the environment. • Wailing/vocalising • Rolling around/showing belly • Lordosis position/raised rear 	2

Question Number	Answer	Mark
1 (b)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>Conservation (1) as they are endangered (1).</p> <p>Reduce inbreeding (1) due to limited range/numbers/isolation (1).</p> <p>Reduce hybridisation (1) by preventing mating with domestic cats (1)</p> <p>Increase population (1) as the population is declining (1)</p> <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
1 (c)	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Genetic disorders (1) due to limited number of alleles (1).</p> <p>Increased susceptibility to disease (1) As no resistant genes in the population (1).</p> <p>Reduced fertility (1) as mutations are concentrated in the population(1).</p> <p>Increase in physical problems/disorders/ reduced life expectancy (1) as an increase in homozygous recessive alleles. (1).</p> <p>decreased gene pool (1) as the cats that mate are already closely related/share the same genes (1)</p> <p>An increase in fatal alleles (1) leading to a decreased population (1)</p> <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
2 (a)	<p>Award one mark for any of the following up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Abdominal palpitation • Ultrasound • X ray • Swollen belly • Nipples enlarge/redden (pinking up) • Appetite increases • Heat cycle stops • Weight gain • Nesting activities 	4

Question number	Indicative content	
2 (b)	<p>Answers will be credited according to the learner’s demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive.</p> <p>Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <p>Answers will consider all the factors that need to be covered when assessing livestock for their suitability including; animal’s purpose, effectiveness in breeding, breed standards and meeting the aim of purchase.</p> <ul style="list-style-type: none"> • Breed standards • Hardiness • Temperament • Ease of parturition • Desirability • Financial value • Possible choices include e.g. Norwegian Forest cats, Maine Coons (not an exhaustive list) • Possible rejections e.g. Ragdolls, Persians (not an exhaustive list) 	
<p>Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</p>		
Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–4	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. • Limited reference to relevant evidence linked to the assessment. • A recommendation may be presented but will lack focus and be superficial and underdeveloped.
Level	Mark	Descriptor
Level 2	5–8	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. • The answer is mostly supported through the application of relevant evidence drawn from the assessment and wider research. • Recommendation will be mostly focused and developed and show some linkages and lines of reasoning.
Level 3	9–12	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. • Answer is fully supported throughout by sustained application of relevant evidence drawn directly from the assessment and wider independent research. • Recommendation will be clear, concise, and well developed showing comprehensive linkages and lines of reasoning.

Question Number	Answer	Mark																																														
3 (a)	<p>Award one mark for each of the following to a maximum of eight marks.</p> <table border="1"> <tr> <td colspan="2" rowspan="2"></td> <td colspan="4">AaTt (1)</td> <td rowspan="2">(1)</td> </tr> <tr> <td>AT</td> <td>At</td> <td>aT</td> <td>at</td> </tr> <tr> <td rowspan="4">aaTt(1)</td> <td>aT</td> <td>AaTT</td> <td>AaTt</td> <td>aaTT</td> <td>aaTt</td> <td rowspan="4"></td> </tr> <tr> <td>at</td> <td>AaTt</td> <td>Aatt</td> <td>aaTt</td> <td>aatt</td> </tr> <tr> <td>aT</td> <td>AaTT</td> <td>AaTt</td> <td>aaTT</td> <td>aaTt</td> </tr> <tr> <td>at(1)</td> <td>AaTt</td> <td>Aatt</td> <td>aaTt</td> <td>aatt</td> </tr> <tr> <td></td> <td>Correct completion of the Punnett square (1)</td> <td colspan="4"></td> <td></td> </tr> </table> <table border="1"> <tr> <td>Probability</td> <td>Tabby Manx 4/25% (1)</td> <td>tabby normal 2/12.5% (1)</td> <td>solid Manx 4/25% (1)</td> <td>solid normal 2/12.5% (1)</td> <td>kittens would not survive 4/25% *(1)</td> </tr> </table> <p>*may be listed as tabby lethal 2, solid lethal 2</p>			AaTt (1)				(1)	AT	At	aT	at	aaTt(1)	aT	AaTT	AaTt	aaTT	aaTt		at	AaTt	Aatt	aaTt	aatt	aT	AaTT	AaTt	aaTT	aaTt	at(1)	AaTt	Aatt	aaTt	aatt		Correct completion of the Punnett square (1)						Probability	Tabby Manx 4/25% (1)	tabby normal 2/12.5% (1)	solid Manx 4/25% (1)	solid normal 2/12.5% (1)	kittens would not survive 4/25% *(1)	8
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Question Number	Answer	Mark
3 (b)(i)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>The gene is on the X chromosome (1) so males only have one copy (1).</p> <p>Sex of offspring determines if an allele is expressed (1) because it is carried on the X/sex chromosome (1)</p> <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
3 (b)(ii)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>(1) one gene is controlled by another (1) to affect the expression of the phenotype/a gene interaction (1)</p> <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
4 (a)	<p>Award one mark for the identification and one additional mark for the appropriate description to a maximum of six marks.</p> <p>Stomach tubing Insert a tube down the oesophagus/directly into the stomach (1) to ensure enough food/nutrients/when there is no sucking reflex (1).</p> <p>Incubation Appropriate/controlled environment (1) so temperature/humidity is constant (1) as the neonate cannot regulate itself/to support development (1)</p> <p>Access to colostrum To provide antibodies (1) so the new born can fight off infections (1)</p> <p>colostrum has high fat/protein (1) to meet nutritional needs (1)</p> <p>provides essential nutrients (1) in the first 24 hours (1)</p> <p>Accept any other appropriate wording.</p>	6

Question Number	Answer	Mark
4 (b)(i)	<p>Award one mark for each descriptive point up to a maximum of two marks.</p> <ul style="list-style-type: none"> • Norwegian forest cats are prone to it. • It is often fatal. • There are many types. • It is when an animal cannot metabolise glycogen properly. • Abnormal glycogen builds up. • Often is fatal/leads to stillbirth/heart failure. • Can cause muscular weakness/atrophy. • Leads to inability to use limbs. • Can cause enlargement/failure of organs. <p>Accept any other appropriate answers.</p>	2

Question Number	Answer	Mark
4 (b)(ii)	<p>Award one mark for any of the following descriptive points up to a maximum of two marks:</p> <ul style="list-style-type: none"> • A gap/hole in the muscle wall • Internal body/bowels push through it • They can lead to reduced blood supply to the bowel. • Some may be fatal if untreated. • Often close on their own • These include umbilical/hiatal/inguinal. <p>Accept any other appropriate answers.</p>	2

Question Number	Answer	Mark
4 (c)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>Kitten food/specialist food (1) as it contains sufficient nutrients (1).</p> <p>Increased protein (1) for tissue repair/milk production (1).</p> <p>Increased calcium (1) for bone growth in kittens (1).</p> <p>Increased water (1) to prevent dehydration (1).</p> <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
4 (d)	<p>Award one mark for identification of the legislation and one additional mark for appropriate expansion to a maximum of four marks.</p> <p>Animal Welfare Act 2006 (1) applies to cats (1) includes the five needs (1) such as a suitable diet* (1) ensures cats are cared for correctly (1)</p> <p>*Credit one accurate example of needs</p> <p>Pet Animals Act 1951 (1) protects animals sold as pets (1) requires you to have a licence to sell through pet shops (1) to ensure cats go to suitable homes (1)</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
5 (a)	<p>Award one mark for identification and one additional mark for appropriate expansion to a maximum of six marks.</p> <p>Insertion An addition of a base into a sequence (1) causing a frameshift/changing how the sequence is read/ resulting in different amino acid sequence/protein produced (1).</p> <p>Nonsense A change in the sequence to a stop codon (1) so the protein is not made correctly (1).</p> <p>Silent A change in the sequence that does not change the base (1) so the protein is not changed (1).</p> <p>Accept any other relevant phrasing/wording.</p>	6

Question Number	Answer	Mark
5 (b)	<p>Award one mark for each descriptive point to a maximum of two for each example giving a total of four marks.</p> <p>Positive assortative mating Animals with similar phenotypes (1) mate more often than would be expected by random (1).</p> <p>Animals with different phenotypes (1) mate less often than would be expected by random (1).</p> <p>Negative assortative mating Animals with different phenotypes (1) mate more often than would be expected randomly (1).</p> <p>Animals with similar phenotypes (1) mate less often than would be expected by random (1).</p> <p>Accept any linked pair.</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question number	Indicative content	
6 (a)	<p>Reasons for breeding e.g. pet trade, showing.</p> <ul style="list-style-type: none"> ○ Temperament/behaviour ○ Inbreeding coefficient/pedigrees ○ Fertility/breeding records ○ Health and age of the stud ○ <p>Breed Standards (this may be a discussion of a particular identified breed) to include</p> <ul style="list-style-type: none"> ○ Head shape/size ○ Coat colour ○ Coat texture/hair length ○ Posture/conformation ○ Size 	
<p>Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</p>		
Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions. • Few of the points made will be relevant to the context in the question. • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.
Level	Mark	Descriptor
Level 2	3–4	<ul style="list-style-type: none"> • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions. • Some of the points made will be relevant to the context in the question, but the link will not always be clear. • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way.
Level 3	5–6	<ul style="list-style-type: none"> • Demonstrates mostly accurate and detailed knowledge and understanding. • Most of the points made will be relevant to the context in the question, and there will be clear links. • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way.

Question number	Indicative content	
6 (b)	<ul style="list-style-type: none"> ○ Reduce inbreeding by negative assortive mating as individuals are not geographically separated. ○ Maximise the survival of offspring by providing a suitable environment, reducing predation. ○ Maximise public awareness and fundraising to support captive and wild populations. <p>‘Animals do not learn natural behaviours, especially hunting techniques.</p> <ul style="list-style-type: none"> ○ The animals could be kept for human ‘entertainment’ when there is no realistic possibility of being returned to the wild. ○ Wild populations are not conserved as people think there is no problem. ○ There is a danger of escapes from the captive environment into inappropriate environments. 	
<p>Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</p>		
Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–3	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions. • Few of the points made will be relevant to the context in the question. • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.
Level	Mark	Descriptor
Level 2	4–8	<ul style="list-style-type: none"> • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions. • Some of the points made will be relevant to the context in the question, but the link will not always be clear. • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way.
Level 3	9–12	<ul style="list-style-type: none"> • Demonstrates mostly accurate and detailed knowledge and understanding. • Most of the points made will be relevant to the context in the question, and there will be clear links. • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way.



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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