Mark Scheme (Results)

June 2019

Pearson BTEC Level 3 – Animal Management

Unit 1: Animal Breeding and Genetics (31644H)

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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.
- Marking 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 marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking 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 marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The marking grids have been designed to assess learner work holistically. Rows in the grids identify the assessment focus/outcome being targeted. When using a marking 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
1a	Award up to a maximum of **two** marks • To give the female privacy (1). • Without it she may reabsorb the foetuses (1). • Reduce stress for the female (1). • So she does not eat the kittens (1). • Prevent the female laying on the kittens (1). • To keep the kittens safe • Allow natural behaviour Accept any other valid response.	2

Question Number	Answer	Mark
1b	Award **one** mark for each descriptive point up to a maximum of **two marks.** • Use the scoop method • Hold against your chest • One hand holding by scruff of the neck • One hand under the rabbit/supporting the weight. Accept any other relevant phrasing/wording.	2

Question Number	Answer	Mark
1c	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. • The female is very territorial (1) so may attack the male (1). • The male may mark the cage (1) rather than mating with the female (1). • The male may investigate the new territory (1) distracting him from mating (1) Accept any other valid response.	4

Question Number	Answer	Mark
2a	Award **one** mark for each identification to a maximum of **four** marks. • Temperament/behaviour • Size • Shape • Colour • Conformation • Health/condition • Breed specific features (accept specific examples) • Age • Genetic defects/Undesirable characteristics Accept any other valid response/wording.	4

Question number	Indicative content
2b	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. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers. 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. • Factors affecting breeding considerations, e.g. size of litters, ease of whelping • Breed standards • Desirable characteristics, especially temperament/size • Assessment of breeding stock for suitability • Recommendations on suitability • Maternal care • Genetic issues related to breed • Husbandry requirements, e.g. grooming

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*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–4	• 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	• 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	• 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.

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>3a</td><td>
One mark each to a total of eight marks.

Identify parental genotypes
Male Ddbb (1)
Female DdBb (1)

Male allele combinations Db db (1)

Female allele combinations, DB Db dB db (1)

<table>
<tr><td></td><td colspan="5">Ddbb</td></tr>
<tr><td rowspan="6">DdBb</td><td></td><td>Db</td><td>Db</td><td>db</td><td>db</td></tr>
<tr><td>DB</td><td>DDBb</td><td>DDBb</td><td>DdBb</td><td>DdBb</td></tr>
<tr><td>Db</td><td>DDbb</td><td>DDbb</td><td>Ddbb</td><td>Ddbb</td></tr>
<tr><td>dB</td><td>dDBb</td><td>dDBb</td><td>ddBb</td><td>ddBb</td></tr>
<tr><td>db</td><td>dDbb</td><td>dDbb</td><td>ddbb</td><td>ddbb</td></tr>
</table>

Correct Punnett square (1)

Correct possible genotypes (1)

Correct phenotypes
Normal sized brown (1)
Normal sized black (1)
Dwarf brown (1)
Dwarf black (1)
Peanut (colours may or may not be identified as they are stillborn) (1)

Correct proportions:
Normal brown 2 normal black 2 dwarf browns 4 dwarf black 4 peanut black 2 peanut brown 2 (accept peanut 4 colour not identified) (1)
</td><td>8</td></tr>
</table>

Question Number	Answer	Mark
3b	Award **one** mark for the identification and **one** additional mark for each appropriate expansion to a maximum of **four** marks. • To be able to identify individuals in an animal's pedigree (1) to reduce the amount of inbreeding (1) and identify possible desirable characteristics (1) that parents may be carriers for (1). • To control the feeding regime (1) to ensure the health of the parents (1) making sure the mother has enough calcium to produce milk (1) and enough protein for the developing young (1). • To identify diseases (1) to prevent breeding from ill mothers (1) to ensure treatments are not still in the mother's system (1) so they do not affect the young (1). • Identify date of conception (1) to estimate date of parturition (1) so you can provide appropriate diet/care (1) and have resources (e.g. nesting boxes) in place (1) • To identify when the buck has been used as a stud(1) to ensure he is not overused (1) and record the successful matings (1) to determine his reliability (1) Accept any other valid response and reverse arguments.	4

Question Number	Answer	Mark
4a	Award **one** mark for the identification and **one** additional mark for each appropriate expansion to a maximum of **six** marks. • Reabsorption (1) when the foetus stops developing (1). • Problems during labour (1), when the kits head is too big (1). • Still birth (1) when the kits die in the womb (1). • Labour does not happen (1), so the kits are never born (1). • Abortion (1) due to maternal disease/ill health/poor nutrition (1) • Mothers may eat young (1) due to inexperience /disturbance (1) • Toxaemia(1) due to inadequate nutrition (1) Accept any other valid response.	6

Question Number	Answer	Mark
4b	Award **one** mark for each identification and **one** additional mark for the appropriate expansion to a maximum of **six** marks. • Provide appropriate bedding material (1) as rabbits are born with no fur (1). • Remove any stillborn/dead rabbits (1) to prevent infection of the rest (1). • Provide heat source/hot water bottle (1) to keep the rabbits warm (1). • Monitor the kits feeding (1) so you know they have fed successfully (1). • Minimal disturbance (1) to allow the mother to bond (1). • Do not handle new born kits (1) to prevent mother killing them (1) • Appropriate diet for the mother (1) so the kits have plenty of milk (1) Accept any other valid response.	6

Question Number	Answer	Mark
4c	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **two** marks. • Appropriate housing (1) to keep correct temperature (1). • Nutritional needs (1) for healthy development/accept specific examples (1). • Monitoring (1) for signs of poor health (1). • Regular feeding (1) to ensure enough milk is taken in (1) Accept any other valid response.	2

Question Number	Answer	Mark
5a	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. • DNA screening (1) to identify defective genes (1). • Hormone therapy (1) to induce ovulation/super ovulation (1). • Artificial insemination (1) to control conception/reduce stress levels (1). • Embryo transfer (1) to ensure viable embryos (1). • Sperm counts (1) to check fertility levels (1) • Ultra sound scans (1) to allow correct prenatal care (1) Accept any other valid response.	4

Question Number	Answer	Mark
5b	Award **one** mark for each identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. • Can result in a harmful change (1) so reducing variation (1). • Can result in a beneficial change(1) so increasing variation (1). • Can have no effect (1) variation is not affected(1). Accept any other valid response.	4

Question Number	Answer	Mark
5c	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. • Lethal alleles (1) where a specific combination kills the embryo (1). • Incomplete dominance (1) where both alleles have an effect (1). • Codominance (1) where either allele can be expressed (1) • Multiple alleles (1) there are a lot of versions of the gene/allele (1). • Epistatic effect (1) where the gene at one locus effects one at another (1). • Sex linkage (1) where the sex affects the phenotype seen (1). Accept any other valid response and relevant examples	4

Question number	Indicative content
6a	• Concentrate recessive/unusual alleles so increase rare desirable characteristics • Increase conformity with breed standards • Increase frequency of deleterious genes • Higher occurrence of inbreeding problems • May be necessary with very small population/rare breed • Outbreeding may be introduced to reduce the deleterious effects

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*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	• 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 2	3–4	• 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	• 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

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>6b</td><td colspan="2">Depends on how/who decides on the ‘desirable characteristics.
The characteristics can make the breed more popular so increase in the number.
Some characteristics can reduce the ‘fitness’.
Genetic diseases can increase.
Specific examples such as increase in peanut syndrome, ear problems in lops.
Non-wild type colours more likely to be predated in the open/if released.
Increase in productivity, e.g. ‘wool’ from angoras, meat from New Zealand Whites.</td></tr>
<tr><td colspan="3">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*.</td></tr>
<tr><td>Level</td><td>Mark</td><td>Descriptor</td></tr>
<tr><td>Level 0</td><td>0</td><td>No rewardable material.</td></tr>
<tr><td>Level 1</td><td>1–4</td><td>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</td></tr>
<tr><td>Level 2</td><td>5–8</td><td>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</td></tr>
<tr><td>Level 3</td><td>9–12</td><td>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</td></tr>
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