

0170-501/001 in Land-based Studies - March 2018

0170-20 Level 2 Technical Award in Land-based Studies

Q	Acceptable answer(s)	Guidance	Max mks
1a	<p>1 mark each for any two from the following, up to 2 marks</p> <ul style="list-style-type: none"> • Regulating major industry and waste • Treatment of contaminated land • Water quality and resources • Fisheries • Inland river, estuary and harbour navigations • Conservation and ecology 	Accept any other suitable answer	2
1b	<p>1 mark for each for any two from the following, up to 2 marks</p> <ul style="list-style-type: none"> • The RSPB offer advice to farms and landowners on how they can conserve habitats • The RSPB offer education to farmers/landowners ensuring the conservation of habitats within working farms • The RSPB help farmers/land owners with applications for subsidies 	Accept any other suitable answer	2
2a	<p>1 mark for each description, up to 4 marks</p> <ul style="list-style-type: none"> • Intensive farming is high input and high output farming. • Selecting and growing high-yield crops • Using fertilisers and pesticides to promote maximum plant growth • Keeping and rearing animals indoors • Hydroponics – horticultural practice used for high yield production of plants. • Growing GM crops, fast growing, disease/parasite resistant • Precision farming practices, optimising growth minimising input. 	Accept any other suitable answer	4
2b	<p>1 mark for each explanation, up to 2 marks</p> <ul style="list-style-type: none"> • To increase production/yield • To compete with other farmers/industry • To increase profit and decrease costs 	Accept any other suitable answer	2

	<ul style="list-style-type: none"> Accept any other relevant answer 		
2c	<p>2 marks for each explanation – up to 4 marks</p> <ul style="list-style-type: none"> Excess fertilisers are washed off the land by rainwater into rivers and lakes (1), may leach into ground waters, then rivers and lakes (1) The increase of nitrate and/or phosphate (1) in the water encourages plant and algae growth (1) The algae forms a bloom over the water surface (1) preventing sunlight reaching other water plants, which then die. (1) Bacteria break down the dead plants (1) and use up the oxygen in the water so the lake may be left completely lifeless (1) 	Accept any other suitable answer	4
3a	<p>1 mark each from the following, up to 4 marks</p> <ul style="list-style-type: none"> Rock particles Water Air Organic matter 		4
3b	<p>Advantages: Any two from the following, up to 2 marks</p> <ul style="list-style-type: none"> Clay soils hold water, which helps plants in times of low rainfall Clay soils are high in nutrients and need less fertiliser <p>Disadvantages: Any two from the following, up to 2 marks</p> <ul style="list-style-type: none"> Clay soils hold moisture, which can affect some plant roots, which may rot Wet clay soils are hard to work Clay soils compact easily when wet, making it hard for plant roots Wet clays dry very hard (form a hard crust), making it difficult for germinating plants 	Accept any other suitable answer	4
4	<p>1 mark each, up to 4 marks</p> <ul style="list-style-type: none"> Botrytis Mildew Rusts Potato blight 	Accept any other suitable answer	4
5	<p>1 mark per correct answer, up to 3 marks</p> <ul style="list-style-type: none"> A cow is a ruminant A cow has four stomachs (three pre-chambers to the one true stomach) A dog is a non-ruminant A dog has one stomach 	Accept any other suitable answer	3

	<ul style="list-style-type: none"> • A cow's digestive system is designed to be a herbivore • A dog 's digestive system is designed to be an omnivore 		
6	<p>1 mark each from any three of the following, up to 3 marks</p> <ul style="list-style-type: none"> • To ensure animals are fed the right food • To ensure animals are not over/under fed • As a method of communication between staff • Feeding can be monitored against animal weight gain or loss • Feed stock can be rotated, so it does not go off • Hygiene can be monitored 	Accept any other suitable answer	3
7	<p>2 marks per description – up to 6 marks</p> <ul style="list-style-type: none"> • Very low or cold temperature (1 mark) is not favourable for seed germination (1 mark) • Lack of moisture (1 mark), dry seeds do not germinate (1 mark) • Correct light level, not all seed require light most need it to start germination.(1) All seedlings require light to grow (1 mark) • Adequate soil nutrients (1) as nutrients are required for the growth of the plant (1 mark) • Viability of the seeds (1 mark), seeds that are too old may not grow (1 mark) • Oxygen (1 mark) – the germinating seed and seedling need oxygen for respiration (1 mark) • Growing medium, correct planting medium (1) will hold moisture and nutrients for the germinating seed and subsequent seedling (1) 	Accept any other suitable answer	6
8	<p>1 mark each from any of the following, up to 4 marks</p> <ul style="list-style-type: none"> • Tractor • Mower • Forage harvester • Trailer • Bailer • Wrapper • Silage pit • Bale handler/loader 	Accept any other suitable answer	4
9	<p>1 mark for each description, up to 4 marks</p> <ul style="list-style-type: none"> • Age restrictions (some pieces of equipment require the operator to be 16 or 18 years of age or over) 	Accept any other suitable answer	4

	<ul style="list-style-type: none"> • Skill level and training required by staff in order to operate machinery • Operator certification – may require a formal qualification (e.g. forklift truck licence) • Health and Safety – appropriate PPE needs to be worn • Risk assessment must be carried out and complied with. • Industry regulation restrictions on activity • Insurance regulation restrictions on activity 		
10	<p>1 mark per explanation, up to 2 marks</p> <ul style="list-style-type: none"> • Reduction of inherited diseases – (avoiding breeding animals with genetic diseases) • Increased variation (a greater variation of genes in a population, reduces risk of disease) • Production of disease/chemical resistant plants/animals 	Accept any other suitable answer	2
11	<p>Band 1: 1 – 4 marks Basic discussion with minimal range of benefits and limited reference to the impact/conflicts on the increased use of technology and equipment in the land-based sector. To access the higher marks in the band, the response will attempt to make relevant suggestions on reducing the impact.</p> <p>Band 2: 5 – 8 marks A range of benefits and conflicts discussed with clear links made to impact on production, sustainability and land management with some reference of how to reduce impacts of technology and machinery. To access the higher marks in the band, the response will be balanced with recommendations or conclusions that are mostly supported.</p> <p>Band 3: 9 – 12 marks A detailed description and comparison of an extensive range of benefits and conflicts with clear relevant links to production, sustainability and land management; clear suggestions on how to reduce impact of technology and machinery, demonstrating a sound understanding of the subject. To access the higher marks in the band, the response will be well balanced with recommendations made that are fully justified and conclusions that are fully supported.</p>	<p>Indicative content:</p> <p>Benefits:</p> <ul style="list-style-type: none"> • Increased crop/animal production/yield • Increased profit and competitiveness/sustainability • Improve land management • Reduced staffing costs • Larger equipment can cover more space/time of harvest etc. • Precision farming with less waste • May impact environment less – e.g. precision fertiliser application • Increase in animal welfare – e.g. robotic milking parlours • Any other relevant content <p>Conflicts:</p> <ul style="list-style-type: none"> • Initial costs are high and may take a long time to pay off • High costs may restrict competition within 	12

		<p>agricultural businesses over larger rivals</p> <ul style="list-style-type: none"> • Intensive farming and large, heavy equipment may have an adverse effect on the environment • Heavy machinery compacts soils • Less people employed in the agricultural sector • May need special training to use equipment • Removal of hedges to allow larger equipment can effect wildlife and the environment. • Increased erosion with larger fields and equipment • Noise and dust pollution • Infrastructure damage of large machinery • Any other relevant content <p>Reducing impact:</p> <ul style="list-style-type: none"> • Train staff to use new technologies/machinery • Use machinery with wider tyre to reduce compaction of soils • Careful management to reduce impact on soil and environment of intensive farming • Prevent removal of hedges • Purchase quieter machinery to reduce noise pollution • Use of battery powered equipment • Any other relevant content <p><i>For no awardable content, award 0 marks.</i></p>	
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