

**0171-012/512 Level 3 in Agriculture – Theory exam (2) Arable - March 2018**

**0171-33 Level 3 Advanced Technical Extended Diploma in Agriculture (1080**

Q	Acceptable answer(s)	Guidance	Max mks
1	<p><b>a) 1 mark for each type of waste, up to 2 marks</b> Organic waste - any two of: stubble; straw; silage; any crop residues, green waste, sludge.</p> <p><b>b) 1 mark for any reasonable explanation</b></p> <ul style="list-style-type: none"> <li>• Stubble/straw/sludge/green waste would be incorporated into the soil</li> <li>• Silage/straw can be fed to livestock</li> <li>• Crop residue could be fed to live stock or incorporated</li> <li>• Silage/green waste to anaerobic digestion plant</li> </ul>	<p>a) Accept any other reasonable examples of organic waste</p> <p>b) Accept any other suitable answers</p>	3
2	<p>a) 1 mark for: Nitrate Vulnerable Zone</p> <p>b) 1 mark each for any of the following, up to 4 marks</p> <ul style="list-style-type: none"> <li>• There are limits to the amount of nitrate fertiliser that can be put on a field or farm.</li> <li>• There are ‘closed periods’ when nitrates cannot be spread on to fields.</li> <li>• Extensive records need to be kept on all nitrate fertiliser applications, whether organic or in organic</li> <li>• There are extensive rules on storage facilities for organic and inorganic fertilisers</li> <li>• Farmers must not exceed nutrient requirements for individual crops</li> </ul>	7b - Accept any other suitable answers	5
3	<p><b>a) 1 mark for any of the following:</b></p> <ul style="list-style-type: none"> <li>• Bins</li> <li>• Waste skips</li> <li>• Dumpy bags</li> <li>• Any other suitable answer</li> </ul> <p><b>b) 1 mark each for any of the following , up to 2 marks</b></p>	Accept any other suitable answers	4

	<ul style="list-style-type: none"> <li>• Returnable containers such as pesticide containers that can be sent back to the manufacturers</li> <li>• Reducing the volume by pelleters/shredders/compaction, chippers</li> <li>• Recycling or reusing materials i.e metals, paper and plastics</li> <li>• Any other suitable answer</li> </ul> <p><b>c) 1 mark for any of the following</b></p> <ul style="list-style-type: none"> <li>• Spread organic waste, such as farm yard manure on the fields complying with current legislation (1 mark)</li> <li>• Supply an anaerobic digestion plant</li> <li>• By exchanging muck/straw with other farmers</li> <li>• Any other suitable answer</li> </ul>		
<b>4</b>	<p><b>a) 1 mark per definition , up to 2 marks</b></p> <p>i) Biotic - the living parts of a landscape or eco-system  ii) Abiotic - the non-living parts of a landscape or eco-system  (Accept any other suitable wording)</p> <p><b>b) 1 mark for each example</b>  <b>Biotic-</b> plants, animals, fungi, micro-organisms</p> <p><b>c) 1 mark for each example</b>  <b>Abiotic</b> – water, air temperature, soil, sun</p> <p><b>d) 2 marks per explanation, up to 4 marks</b></p> <ul style="list-style-type: none"> <li>• No spray zones around the outside of fields (1) to increase flora and fauna (1)</li> <li>• Use of effective rotations (1) to give a varied range of conditions (1)</li> <li>• Timing of field operations (1) such as cutting hedges every 3 years at the correct time of year, to encourage nesting birds and provide over winter food (1)</li> </ul>	Accept any other suitable answers	<b>8</b>
<b>5</b>	<p><b>1 mark per consequence explained, up to 2 marks</b></p> <ul style="list-style-type: none"> <li>• Water quality could be at risk from Nitrates</li> <li>• You could be fined or have payments withheld</li> <li>• Eutrophication resulting in excessive plant life</li> <li>• Eutrophication resulting in killing fish</li> </ul>	Accept any other suitable answers	<b>4</b>
<b>6</b>	<p><b>1 mark per description, up to 4 marks</b></p> <ul style="list-style-type: none"> <li>• Keep boom as low as possible, but not too low so as to cause striping</li> <li>• Use LERAP 3-star low drift nozzles</li> </ul>	Accept any other suitable answers	

	<ul style="list-style-type: none"> <li>• Use lower pressure and larger nozzles, staying within the recommended spray quality for the chemical</li> <li>• Slow down to try to avoid boom bounce and yaw</li> <li>• Climatic conditions - more drift likely in very hot or windy/still conditions</li> </ul>		
7	<p><b>a) 1 mark for:</b> Sites of Special Scientific Interest.</p> <p><b>b) 1 mark for any of the following</b></p> <ul style="list-style-type: none"> <li>• A unique plant or animal</li> <li>• Burial mound</li> <li>• Historic monument</li> <li>• Important Archaeological area</li> </ul>	b) Accept any other suitable answers	2
8	<p><b>a) 1 mark for each of the following, up to 2 marks</b></p> <ul style="list-style-type: none"> <li>• Warning symbol</li> <li>• PPE</li> <li>• First aid information</li> <li>• The maximum dose rates</li> <li>• MAPP number</li> </ul> <p><b>b) 2 marks per description</b></p> <ul style="list-style-type: none"> <li>• Auto steer has made driving more accurate (1) especially on fields without tramlines, less chance of overlap or misses (1)</li> <li>• Headland auto cut off preventing overlaps and misses on the headland (1) and to reduce operator error (1)</li> <li>• Individual nozzle cut off technology to prevent overlaps (1) especially on short work (1)</li> <li>• Anti-drift technology such as low drift nozzles (1)</li> <li>• Anti-drift technology- angled nozzles for better penetration into crops (1)</li> <li>• Anti-drift technology-air down draft on the boom (1)</li> </ul>	Accept any other suitable answers	6
9	<p><b>a) 1 mark each</b></p> <p>i) Too higher pressures would give less grip/more compaction/ increased centre of tyre wear mark)</p> <p>ii) uneven tyre pressures would make the ATV unstable/risk of overturn/increased tyre wall damage</p> <p><b>b) 2 marks for explanation</b></p> <ul style="list-style-type: none"> <li>• It is designed to check much higher pressures</li> <li>• It would not be accurate enough for tyres that only needed around 2-5 psi/0.15 – 0.3 bar.</li> </ul>	Accept any other relevant answer	4

10	<p><b>1 mark for each, up to 2 marks</b></p> <ul style="list-style-type: none"> <li>• Torque Converter</li> <li>• Hydrostatic Transmission</li> </ul> <p><b>1 mark for each advantage, up to 2 marks</b></p> <ul style="list-style-type: none"> <li>• It will not stall</li> <li>• Automatic transmission (no gear changing required)</li> <li>• Quick changing from forward to reverse (speeds up operation)</li> </ul>	Accept any other relevant answer	4
11	<p>a) <b>1 mark for each reason, up to 2 marks</b></p> <ul style="list-style-type: none"> <li>• The machine will be more unstable with the boom out causing over turn (1)</li> <li>• the back wheels could come off the ground affecting the steering of the machine (1)</li> </ul> <p>b) <b>1 mark from the following</b></p> <ul style="list-style-type: none"> <li>• A light system that goes from green to red</li> <li>• an audible warning</li> </ul>	Accept any other relevant answer	3
12	1 mark for: Up and down	accept either up or down	1
13	<p><b>Band 1 (1-4 marks)</b> Minimal range of methods to minimise the environmental impact when fertiliser spreading discussed. Limited considerations of how to minimise, manage and dispose of waste. Few specialist terms used with little structure to the discussion given.</p> <p><b>Band 2 (5-8 marks)</b> Good range of methods to minimise the environmental impact when fertiliser spreading discussed. Adequate considerations of how to minimise, manage and dispose of waste. Some specialist terms will be used correctly. Information will be presented in an adequately structured format.</p> <p><b>Band 3 (9-12 marks)</b> Extensive range of methods to minimise the environmental impact when fertiliser spreading discussed. Detailed considerations of how to minimise, manage and dispose of waste. Information will be presented in a well-structured and clear format.</p>	<p><b>Indicative content:</b></p> <ul style="list-style-type: none"> <li>• Follow current legislation and codes of practice</li> <li>• Keep accurate store records so you know exactly what fertiliser you have already in store</li> <li>• Order the correct quantity of fertiliser to avoid waste</li> <li>• Calibrate the spreader carefully to avoid waste</li> <li>• Check weather forecast, do not spread in very windy conditions or if heavy rain is imminent</li> <li>• Keep operator training up-to-date</li> <li>• Avoid spillage when filling spreader and sweep up any spills immediately</li> <li>• Do not spread on waterlogged, frozen or very dry, cracked ground.</li> </ul>	12

- Do not exceed recommended application rate for specific crops
- Set spreader up correctly on the tractor to give an even spread pattern. Level, vanes in correct position, PTO speed.
- Use buffer zones next to water ways to avoid contamination
- Use GPS or similar method to avoid overlap/double dosing
- Use vari-rate application technology if available
- If any fertiliser is left over, spread it on suitable ground, making sure not to exceed maximum application rate.
- If you are in a Nitrate Vulnerable Zone ensure you follow all guidelines, including 'closed' periods
- Use headland management system for your spreader to avoid fertiliser going in to hedges, conservation strips and water ways.
- After use, wash out spreader in a suitable area such as, in the field, to avoid it getting it in to drains and waterways.
- Keep operator records in case of future problems

***For no awardable content, award 0 marks.***