

Qualification: 0171-33-012/512 Level 3 Agriculture-Theory exam (2) -Arable
June 2018

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| 1 | From a crop production process, name | | |
| | a) two organic wastes (2 marks) b) one inorganic waste (1 mark) c) one hazardous waste. (1 mark) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark for each waste, up to 4 marks | Accept any reasonable examples of waste | 4 |
| | a) Organic waste – 1 mark each for any 2 of: stubble; straw; silage; crop residues. b) Inorganic waste – 1 mark for any one of: fertiliser and chemical packaging such as cardboard; glass; plastic; fertiliser bags, metal wearing parts c) Hazardous waste – 1 mark for any one of: pesticides (dilute or concentrated); silage effluent; spilt fertiliser, treated seed | | |
| 2 | Explain how to minimise the effects on the environment when spreading organic waste. (8 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark each for any of the following, max 8 marks | Accept any other relevant answer | 8 |
| | <ul style="list-style-type: none"> • Follow current legislation and codes of practice such as, Code of good Agricultural Practice Soil, Water and Air • Compliance with Nitrate Vulnerable Zone legislation. • Minimise ammonia volatilisation into the atmosphere by choosing suitable incorporation and application methods. • Use GPS and nutrient management maps for increased accuracy | | |

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| | <ul style="list-style-type: none"> • Check the direction of wind when spreading near houses, to avoid complaints of smell • Do not spread on frozen or waterlogged ground to avoid 'run off' • Plough in or incorporate as soon as possible to control smell and stop ammonia volatilisation • Spread at least 50m from bore holes and 10m from water courses • Only spread up to crop requirement to avoid leaching • Use wide tyres and do not spread on wet ground to minimise soil compaction | | |
| 3 | <p>a) What is the living part of a landscape or eco-system technically known as? (1 mark)</p> <p>b) What is the non-living part of a landscape or eco-system technically known as? (1 mark)</p> <p>c) Farming landscapes change continuously. Describe two possible ecological effects of liming on agricultural soils. (4 marks)</p> | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>a) Biotic (1 mark)</p> <p>b) Abiotic (1 mark)</p> <p>c) 2 marks per description, up to 4 marks</p> <ul style="list-style-type: none"> • Adding lime to a soil to increase the pH could encourage some plants to grow (1) thus increasing insects that feed on them and biodiversity as a result (1). • Adding lime to a soil could discourage acid loving plants from growing (1) and consequently the animals that feed on them to decline (1). • It improves micro-organism activity (1) which improves soil and crop health (1) | Accept any other suitable description | 6 |
| 4 | State two pieces of legislation or policy that have had an ecological effect, changing the agricultural landscape over time. (2 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>1 mark each, up to 2 marks</p> <ul style="list-style-type: none"> • The General Enclosures Act 1845 (1 mark) • Common Agricultural Policy (CAP) (1 mark) • Wildlife and Countryside Act 1981 (1 mark) • Hedgerows Regulations 1997 (1 mark) • Corn laws | Accept any other suitable answer | 2 |

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| 5 | Explain two advantages of incorporating a beetle bank in to an arable field. (2 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark each, up to 2 marks <ul style="list-style-type: none"> • To encourage beetles and other beneficial insects and their larvae which eat pests of the crop • Result in less reliance on pesticides by using cultural control methods • It creates a wildlife corridor which increases flora and fauna biodiversity • Government financial incentive scheme to encourage wildlife | Accept any other suitable answer | 2 |
| 6 | A farmer’s Biodiversity Action Plan (BAP) states that species rich hedges will only be cut in February. Explain two reasons why this is good for the hedgerow habitat. (2 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark each, up to 2 marks <ul style="list-style-type: none"> • In February, you will not be damaging nests or scaring off birds about to nest. (1 mark) • Leaving cutting until February leaves food for birds/animals over winter (1 mark) | Accept any other suitable answer | 2 |
| 7 | Describe four factors that could cause striping in a growing crop, when using a twin spinning disc fertiliser spreader. (4 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark per description, up to 4 marks <ul style="list-style-type: none"> • Vanes incorrectly set or damaged on the discs, causing the fertiliser to be spread too far or not far enough (1 mark) • Fertiliser spreader not set level on the tractor, using the top link and lower link arms (1 mark) • Height of fertiliser spreader discs from top of the crop, incorrectly set (1 mark) • Power take off too fast or too slow causing the fertiliser to be spread too far or not far enough (1 mark) • Driving too close or too far apart, overlapping or under applying fertiliser (1 mark) • Consistency of product causing flow rate issues | Accept any other suitable answer | 4 |

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| 8 | When spraying, how would the work rate be affected when increasing the dilution rate from 100 litres/ha to 200 litres/ha. (2 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 1 mark each, up to 2 marks <ul style="list-style-type: none"> • half the number of hectares with each tank • By decreasing the work rate | Accept any other suitable wording | 2 |
| 9 | a) What does the acronym LERAP stand for? (1 mark) b) If a farmer is in the LERAP scheme, what may it allow them to do? (1 mark) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | a) Local Environment Risk Assessment for Pesticides (1 mark) b) Reduce the buffer zone next to water ways (1 mark) | Accept any other suitable wording | 2 |
| 10 | Describe two ways modern technology has improved the accuracy of applying fertilisers. (4 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | 2 marks each, up to 4 marks <ul style="list-style-type: none"> • Auto steer has made driving more accurate especially on fields without tramlines, (1 mark) less chance of overlap or misses (1 mark) • Headland auto cut off automatically cutting off the fertiliser at the headland (1) preventing overlaps and misses on the headland (1 mark) • Variable rate application maintains the rate of application irrespective of forward speed (1) allowing operator to change forward speed without affecting the application rate (1 mark) • Computer technology use to link fertiliser rates to yield and/or soil mapping (1) to prevent under or overdosing of crop nutrients (1) | Accept any other suitable answer | 4 |
| 11 | a) State three main components of a hydrostatic transmission system on a Rough Terrain Fork Lift (RTFL). (3 marks) b) What is the main advantage of hydrostatic transmission over mechanical gear transmission? (1 mark) | | |

| | Acceptable answer(s) | Guidance | Max mks |
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| | <p>a) 1 mark each, up to 3 marks</p> <ul style="list-style-type: none"> • Oil • Pump • Hydraulic Motors <p>b) It has infinitely variable control over ground speed in both directions. (1 mark)</p> | Accept any other suitable answer | 4 |
| 12 | When cornering slowly with an All-Terrain Vehicle (ATV) without a differential, why is it necessary for the driver to transfer their body weight to the outside wheel? (3 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>1 mark per point, up to 3 marks</p> <p>On an ATV without a differential, both back wheels turn at the same speed making it difficult to turn (1). By transferring the weight to the outside wheel, it takes weight off the inside wheel (1), allowing it to slip a little and allowing the ATV to turn more easily.(1)</p> | Accept any other suitable answer | 3 |
| 13 | Name one setting that could affect an ATV's stability at high speed and traction at low speed. (1 mark) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>Accept any one of the following answers for 1 mark</p> <ul style="list-style-type: none"> • Incorrect tyre pressures • Too much weight on the front of the vehicle | Accept any other suitable wording | 1 |
| 14 | Apart from engine oil, water and diesel, list four other checks to be made on a Rough Terrain Telescopic Forklift (RTFL), particularly relevant to travelling on the road. (4 marks) | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>1 mark each from the following, up to 4 marks</p> <ul style="list-style-type: none"> • Tyre pressures are correct • Lights working correctly • Brakes are working • Tyre condition – no splits or bulges • Indicators are working • Horn working • Check that windows and mirrors are clean | Accept any other suitable answer | 4 |

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| | <ul style="list-style-type: none"> • Check seat belt is in working order • steering is locked in correct mode | | |
| 15 | Discuss methods of minimising the environmental impact when spraying pesticides, including considerations of how to minimise, manage and dispose of waste. | | |
| | Acceptable answer(s) | Guidance | Max mks |
| | <p>Band 1 (1-4 marks) Minimal range of methods to minimise the environmental impact when spraying 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>Band 2 (5-8 marks) Good range of methods to minimise the environmental impact when spraying 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>Band 3 (9-12 marks) Extensive range of methods to minimise the environmental impact when spraying 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>Indicative content:</p> <ul style="list-style-type: none"> • Follow current legislation and codes of practice • Only spray if absolutely necessary, can cultural control be used instead? • Can a less harmful chemical be used to perform the same job? • Keep accurate store records so you know exactly what chemicals you have already in store • Order the correct quantity to avoid waste • Read and adhere to all aspects of chemical label including correct dose rate and dilution rate • Calibrate the sprayer carefully to avoid waste • Check weather forecast, do not spray in windy conditions or if rain is imminent • Keep operator training up-to-date and ensure they have a Certificate of Competence • Avoid spillage when filling sprayer • Triple rinse spray containers • Use methods to minimise spray drift such as; low drift nozzles, correct size nozzles and pressure, keep boom as low as possible, keep speed down | 12 |

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| | | <ul style="list-style-type: none">• Use buffer zones next to water ways to avoid contamination• Use GPS or similar method to avoid overlap/double dosing• Use of bio-beds if available• Leave part of the headland unsprayed so washings can be sprayed on it• Keep application records in case of future problems• Use safe and efficient, disposal using licensed waste disposal contractors where necessary <p><i>For no awardable content, award 0 marks.</i></p> | |
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