



Qualification title: Level 3 Advanced Technical Certificate in Forestry and Arboriculture

Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture (1080)

Exam: 0174-012/512 Level 3 Horticulture – Theory Exam

Version: April 2017

Exam date: 26 April 2017

Exam time: 13:30

Base mark: 60

Question no.	Answer	Mark allocation
1.	<p>1 mark for each piece of legislation named; maximum 2 marks</p> <p>Any TWO from:</p> <ul style="list-style-type: none">• Provision and Use of Work Equipment Regulations 1998 (PUWER)• Health and Safety at Work Act 1974• Management of Health and Safety at Work Regulations 1999• Control of Substances Hazardous to Health Regulations 2002 (COSHH)• Manual Handling Operations Regulations 1992• Personal Protective Equipment (PPE) at Work Regulations 1992• Environmental Protection Act 1990• Wildlife and Countryside Act 1981• Control of Noise at Work Regulations 2005• Control of Vibration at Work Regulations 2005• Lifting Operations and Lifting Equipment Regulations 1998	2

	Allow marks if year missed.	
2.	<p>1 mark for each explanation; maximum 2 marks</p> <ul style="list-style-type: none"> • Correct procedures with oil and fuel • Correct oil and fuel storage • Using equipment that controls emissions • Avoiding areas of soil that are unstable or prone to erosion • Avoiding damage or disturbance to protected species • Disposing of waste in an appropriate manner • Avoid pollution of watercourses with fuels or other substances <p>Any other relevant answer.</p>	2
3.	<p>1 mark for any of the following bullet points explained; maximum 3 marks</p> <p>Process:</p> <ul style="list-style-type: none"> • Light levels • Temperature • Time of day/night • Season • Moisture availability • Pollution • Disease and pests • Leaf damage 	3
4.	<p>1 mark for each point made from the list below; maximum 3 marks</p> <p>Features:</p> <ul style="list-style-type: none"> • Open pore structure (non-compacted, good drainage, well aerated) • Good levels of organic matter • Availability of macronutrients and micronutrients • Good numbers of invertebrate organisms • Appropriate pH and levels of organic matter <p>Any other relevant answer.</p>	6

	<p>1 mark for each point made from the list below; maximum 3 marks</p> <p>Impact to physiological process:</p> <ul style="list-style-type: none"> • Good gaseous exchange provides resources for photosynthesis • Availability of water through good infiltration provides resources for photosynthesis • Availability of essential nutrients (minerals) provides resources for photosynthesis and physiological processes • Root penetration for plant stability and to gain access to resources <p>Any other relevant answer.</p>	
5.	<p>1 mark for each method described from the list below; maximum 3 marks</p> <ul style="list-style-type: none"> • Amelioration • De-compaction to break up the soil structure • Cultivation • Soil protection and prevention of damage • Vertical mulching by creating trenches with an air spade which are then filled with organic matter • Surface mulching with organic matter (no deeper than 100mm) • Radial trenching by creating trenches with an air spade which are then filled with organic matter • Application of mycorrhizae <p>Any other relevant answer.</p>	3
6.	<p>1 mark for each reason given from the list below; maximum 2 marks</p> <ul style="list-style-type: none"> • Optimising performance by matching bar/chain length with the power of the saw • Minimising wear and tear on the saw and the operator • Safety. Keeping the chain speed within recommended limits • P U W E R requirement <p>Any other relevant answer.</p>	2

7.	<p>1 mark for each point made from the list below; maximum 2 marks</p> <ul style="list-style-type: none"> • Put felling cuts higher on the stem - to find more sound wood for the hinge • Don't remove buttresses - to increase the amount of solid wood at the edges of the hinge • Use an assisted felling technique - to gain extra control • Leave a larger hinge - to maintain more control 	2										
8.	<p>1 mark for each impact explained per Abiotic factor below (max of 2); maximum 8 marks.</p> <table border="1"> <thead> <tr> <th>Abiotic factor/human influences</th> <th>Impact on tree health</th> </tr> </thead> <tbody> <tr> <td>Road salt</td> <td> <ul style="list-style-type: none"> • Limitation on root function which leads to a lack of water and nutrient uptake • Foliar damage • Lack of resources for photosynthesis • Any other relevant answer </td> </tr> <tr> <td>Lightning</td> <td> <ul style="list-style-type: none"> • Structural damage to the vascular system. • Exposure to pest and diseases • Desiccation • Any other relevant answer </td> </tr> <tr> <td>Mechanical damage</td> <td> <ul style="list-style-type: none"> • Structural damage to the vascular system. • Exposure to pest and diseases • Desiccation • Any other relevant answer </td> </tr> <tr> <td>Frost</td> <td> <ul style="list-style-type: none"> • Leaf damage leading to a lack of available energy for growth • Structural issues/damage • Damage to flower parts • Any other relevant answer </td> </tr> </tbody> </table>	Abiotic factor/human influences	Impact on tree health	Road salt	<ul style="list-style-type: none"> • Limitation on root function which leads to a lack of water and nutrient uptake • Foliar damage • Lack of resources for photosynthesis • Any other relevant answer 	Lightning	<ul style="list-style-type: none"> • Structural damage to the vascular system. • Exposure to pest and diseases • Desiccation • Any other relevant answer 	Mechanical damage	<ul style="list-style-type: none"> • Structural damage to the vascular system. • Exposure to pest and diseases • Desiccation • Any other relevant answer 	Frost	<ul style="list-style-type: none"> • Leaf damage leading to a lack of available energy for growth • Structural issues/damage • Damage to flower parts • Any other relevant answer 	8
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9.	<p>1 mark for each</p> <ul style="list-style-type: none"> • an invertebrate pest 	3										

	<ul style="list-style-type: none"> • a tree decay fungus • a bacteria 	
10.	<p>1 mark for type of environmental impact stated made; maximum 3 marks</p> <ul style="list-style-type: none"> • noise • dust • exhaust gas pollution • possible fuel and oil pollution • physical damage • habitat damage • damage to ground and soil <p>Any other relevant answer.</p>	3
11.	<p>1 mark for each method and example from the list below: maximum 4 marks</p> <ul style="list-style-type: none"> • Cultural (eg Good housekeeping in the nursery / glasshouse) • Chemical (eg Use of insecticides / fungicides in the production chain) • Biological (eg Use of nematodes in the production process) • Targeted intervention: timely and appropriate control measures within the life cycle of biotic pathogens. (eg destruction of OPM egg masses / pheromone traps for OPM males) 	4
12.	<p>Irrigation (1 mark for any of the following)</p> <ul style="list-style-type: none"> • Availability of resources (water / nutrients) <p>Feeding (1 mark for any of the following)</p> <ul style="list-style-type: none"> • Availability of resources (water / nutrients) <p>Tree shelters (1 mark for any of the following)</p> <ul style="list-style-type: none"> • Protection to allow tree to establish • Prevent browsing mammals <p>Any other relevant answers.</p>	3
13.	Band 1 (1-4 marks)	12

	<p>Basic discussion with a limited range and depth of considerations of sanitation felling for disease control in a woodland, but few links made to the scenario. Discussion is not well developed or balanced. Limited justification of their choice of actions. There will be few or no specialist terms.</p> <p>Band 2 (5-8 marks) Adequate discussion of good range and depth of considerations of sanitation felling for disease control in a woodland with good links to the scenario. Good justification of their choice of actions. There will be some use of specialist terms, although they may not always be used appropriately.</p> <p>Band 3 (9-12 marks) Comprehensive discussion with extensive range of considerations of sanitation felling for disease control in a woodland. Clear links to the scenario have been made. Detailed justification of their choice of actions. Specialist terms will be used correctly and appropriately.</p> <p>Indicative content:</p> <ul style="list-style-type: none"> • Legislation (eg HASAWA, CROW, PUWER etc) • Environmental (eg Damage to flora and fauna. Damage to habitats. Pollution of watercourses.) • Practical (eg Method statements and risk assessments for felling and waste. Equipment and labour required.) • Economic (eg cost of labour and equipment) 	
14.	<p>1 mark for each of the following; maximum 3 marks</p> <ul style="list-style-type: none"> • Roots • Shoots • Cambium 	3
15.	<p>1 mark for each reason explained from the list below; maximum 2 marks</p> <ul style="list-style-type: none"> • Faulty spark plug (damaged, gap too big or small): no ignition in the engine • HT lead faulty: no ignition in the engine 	2

	<ul style="list-style-type: none"> • Faulty carburettor: no or incorrect fuel mix passed into the engine • No fuel: no fuel in the engine • Fuel filter blocked: no fuel in the engine • Fuel pipe damaged: no fuel in the engine • Incorrect fuel mix: combustion will not occur • Starter recoil faulty: no drive to the ignition system <p>Any other relevant answer.</p>	
16.	<p>1 mark for each impact described for a stated pathogen; maximum of 2 marks</p> <ul style="list-style-type: none"> • Fungi: Foliar/structural/root damage • Bacteria: vascular dysfunction/canker • Vertebrate: Browsing/ fraying/stripping • Invertebrate: Foliar/transfer disease/boring <p>Any other relevant answers.</p>	2