0174-014/514 Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture (1080)

Level 3 Forestry and Arboriculture – Theory Exam (1)

June 2018

1	State **two** conditioners or ameliorants which can be used to aid tree establishment. (2 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	- Fertilisers (1 mark) - Organic materials (1 mark) - Mycorrhizae (1 mark) - Water retention materials (1 mark)	1 mark for each answer to a maximum of 2 marks. Accept any other suitable answer provided**.**	**2**
2	Identify **two** types of fungal rots. (2 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	- Brown rots - White rots - Soft rots	1 mark for each answer to a maximum of 2 marks. Accept any other suitable answer provided**.**	**2**
3	a) Identify **two** archaeological or historic features of a woodland. (2 marks) b) Describe one of the features identified in question 3a). (2 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	a) - Woodland name (1 mark) - Boundary shape (1 mark) - Wood banks and ditches (1 mark) - Lapsed hedges (1 mark) - Pits (1 mark) - Charcoal hearths (1 mark) - Tracks (1 mark) - Indicator species (1 mark) b)	1 mark for each feature identified up to a maximum of 2 marks	**4**

	• Current name or any other name the woodland has been known by to indicate type of woodland e.g. "Simon's plantation" suggest recently wooded area (1 mark), woodland named after an area would indicate historically wooded area (1 mark). • Geometric shape suggests recently wooded area (1 mark), whereas irregular shape would indicate historically wooded area (1 mark) • Raised mounds and ditch system, often containing older trees (1 mark), possible indication of old woodland boundaries (1 mark) • Hedgerow previously used to mark a boundary, now unmanaged (1 mark), is supportive for wildlife (1 mark) • Depressions in the ground often the sign of previous human activity eg saw pits (1 mark). Is typically a designated site of interest and so should be protected and conserved (1 mark). • Depressions in the ground indicating charcoal production, often containing pieces of charcoal (1 mark). Is typically a designated site of interest and so should be protected and conserved (1 mark). • Frequently used lines of travel through woodland (1 mark), often indicates old routes linked to historical boundaries and land ownership (1 mark) • Plants preferring a particular environment in which to grow and are slow to colonise (1 mark) which indicate previous land-use, ancient woodland etc (1 mark)	1 mark for correct linked description up to a maximum of 2 marks	

4	Identify **two** techniques for supporting trees. (2 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Canes (1 mark) • Stakes and ties (1 mark) • Stakes and crossbar (1 mark) • Underground anchors (1 mark) • Guy wires (1 mark)	1 mark for each answer up to a maximum of 2 marks. Accept any other suitable answer provided.	**2**

5	Describe **two** of the walls of the Compartmentalisation Of Decay In Trees (CODIT), and for **each** briefly explain their purpose. (4 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• Wall 1 – The first wall is formed by plugging up normally conductive vascular tissue above and below the wound. (1 mark) This is the weakest wall. (1 mark) • Wall 2 – The second wall is formed by the thick-walled, lignin-rich cells of the latewood growth ring interior and exterior to the wound, thus slowing the radial spread of decay. (1 mark) This wall is the second weakest. (1 mark)	1 mark for each wall correctly identified up to a maximum of 2 marks **and** 1 mark for each correctly linked purpose to a maximum of 2 marks.	**4**

	• Wall 3 – The third wall is formed by ray cells, which are groups of radiating cells oriented perpendicularly to the stem axis, dividing the stem into segments not entirely unlike the slices of a pie. (1 mark) This is the strongest wall present at time of wounding. (1 mark) • Wall 4 – The fourth wall, known as the barrier zone, is created by new growth of specialised woody tissue on the exterior of the tree, isolating tissue present at the time of infection from subsequent growth. (1 mark) This is the strongest wall. (1 mark) **Note:** Candidate not expected to put word for word as indicated, but expected to demonstrate understanding of CODIT. Their explanation must relate to the relevant wall.		

6	Name one native British coniferous tree by its scientific name. (2 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• *Pinus Sylvestris* (1 mark) • *Taxus Baccata* (1 mark) • *Juniperus Communis* (1 mark)	1 mark for correctly spelled Genus and 1 mark for correctly spelled species up to a maximum of 2 marks.	**2**

7	Identify **four** ancient woodland indicator species. (4 marks)		
	Acceptable answer(s)	**Guidance**	**Max mks**
	• *Juniperus Communis* (1 mark) • *Mercurialis perennis* (1 mark) • *Hyacinthoides non-scripta* (1 mark) • *Oxalis acetosella* (1 mark) **Note:** Accept common names of trees.	1 mark for each ancient woodland indicator species identified up to a maximum of 4 marks. Accept any other suitable answer provided	4

8	Explain any **two** of the following terms. (4 marks) • Thinning • Clearance • Coppice • Glade creation		
	Acceptable answer(s)	**Guidance**	**Max mks**

	Thinking • Removing a proportion of tree crop (1 mark) to achieve management objectives (1 mark) Clearance • Removal of all vegetation from an area (1 mark) in order to replant or naturally regenerate (1 mark) Coppice • Cut back a tree or shrub to ground level (1 mark) to stimulate re-growth (1 mark) Glade creation • Creating an open, clear space within a woodland habitat (1 mark) to allow ground flora/fauna to establish (1 mark)	1 mark for each explanation up to a maximum of 4 marks. Accept any other suitable answer provided.	**4**

9 Identify one suitable tool used for formative pruning and give **two** benefits and **two** limitations of using this piece of equipment. (5 marks)

Acceptable answer(s)	**Guidance**	**Max mks**

• Powered pole pruner (1 mark)
  o **Benefits**
    ▪ Carry out some pruning without access equipment (1 mark)
    ▪ Quick (1 mark)
    ▪ Any other appropriate positive (1 mark)
  o **Limitations**
    ▪ Noisy (1 mark)
    ▪ Less accurate cuts (1 mark)
    ▪ Dangerous in inexperienced hands (1 mark)
    ▪ Expensive to purchase (1 mark)
    ▪ Requires training (1 mark)
    ▪ Requires maintenance (1 mark)
    ▪ Any other appropriate negative (1 mark)
 	
• Pole saw (manual) (1 mark)
  o **Benefits**
    ▪ Lighter than a mechanised pole pruner (1 mark)
    ▪ Fairly accurate cuts (1 mark)
    ▪ Carry out some pruning operations without access equipment (1 mark)
    ▪ Any other appropriate positive (1 mark)
  o **Limitations**
    ▪ Can be cumbersome (1 mark)
    ▪ Expensive to purchase (1 mark)
    ▪ Only appropriate on smaller branches (1 mark)
	1 mark for suitable tool identified, 1 mark for each benefit up to a maximum of 2 marks and 1 mark for each limitation up to a maximum of 2 marks. Accept any other suitable answer provided.	**5**

- Tiring on larger branches (1 mark)
- Any other appropriate negative (1 mark)

- Pruning saw (manual) (1 mark)
  - **Benefits**
    - Light (1 mark)
    - Clean accurate cuts (1 mark)
    - Cheap to purchase (1 mark)
    - Any other appropriate positive (1 mark)
  - **Limitations**
    - Very sharp, many accidents using this tool (1 mark)
    - Only appropriate on smaller branches (1 mark)
    - Tiring on larger branches (1 mark)
    - Any other appropriate negative (1 mark)

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10 Identify **two** environmental conditions and explain how they influence tree growth. (4 marks)

Acceptable answer(s)	Guidance	Max mks
- Temperature (1 mark) – can increase or decrease growth rates (1 mark) - Wind (1 mark) – High wind loading can lead to poor crown development/failure (1 mark) - Soil health (1 mark) – lack of nutrients leading to reduced growth. (1 mark) - Amount of water/waterlogging (1 mark) - Soil aeration/Compaction (1 mark) – can inhibit root development thus the ability to draw up water/nutrients (1 mark) - Nutrient availability (1 mark) – High nutrient availability may encourage weed growth or suppress tree growth (1 mark)	1 mark for each identified environmental condition up to a maximum of 2 marks and 1 mark for each explanation up to a maximum of 2 marks. Accept any other suitable answer provided.	4

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11 Give **three** benefits and **three** limitations of using tree stock supplied as bare root whips. (6 marks)

Acceptable answer(s)	Guidance	Max mks
Benefits - Inexpensive (1 mark) - Quick establishment (1 mark) - Can plant many, quickly (1 mark) - Inexpensive to transport (1 mark) - Easy to plant (1 mark)	1 mark for each benefit up to a maximum of 3 marks and 1 mark for each limitation up to a maximum of 3 marks. Accept any other reasonable benefit or limitation.	6

- **Limitations**
  - Susceptible to rabbit damage (1 mark)
  - Susceptible to transport damage (1 mark)
  - Prone to desiccation (1 mark)
  - High mortality rates (1 mark)
  - Require 'heeling' in to store (1 mark)

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12 Explain **two** reasons why *Platanus x hispanica* is suitable for planting as a highway tree in an urban environment. (4 marks)

Acceptable answer(s)	Guidance	Max mks
- High pollution tolerance (1 mark) perfectly suited to heavily built up urban areas (1 mark) - Tolerance of root compaction (1 mark) ….. (1 mark) - Very fast growing (1 mark) so very quickly establish themselves in the environment (1 mark) - Require only limited pruning (1 mark) so will encourage limited and cost-effective on-going maintenance (1 mark) - Any other correctly explained reason. Reasons may include: - Water tolerance - Pollution tolerance - Salt tolerance - Form - Fast growth rate - Ability to root under permeable surface - Can grow in poor soil conditions Can grow in a range of climates	1 mark for each point made up to a maximum of 2 marks per reason. Accept any other suitable reason provided.	4

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13 List **five** causes of cracks in a tree stem, branch or union. (5 marks)

Acceptable answer(s)	Guidance	Max mks
- Storm event (1 mark) - Uncharacteristic wind event (1 mark) - Over pruning (1 mark) - Heavy rainfall followed by high winds (1 mark) - Mechanical impact (1 mark) - End loading through snow/ice (1 mark) - Decay (1 mark) - Genetic/species of tree (1 mark)	1 mark for each cause up to a maximum of 5 marks. Accept any other suitable cause provided.	5

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14 Compare and discuss the management issues and options for **each** of the following different woodland types.

- An ancient woodland site
- A historic parkland setting / wood pasture

(12 marks)

	Acceptable answer(s)	Guidance	Max mks
	Indicative content • Woodland types eg ancient, ancient semi-natural • Management systems eg coppicing, coppicing with standards, veteran tree management, veteranisation, thinning, pollarding • Woodland habitats eg rides, glades, woodland edges, veteran trees • Pest and disease / threats eg fungi, grazing etc • Cost / resources • Planting / Restocking options eg species and sourcing, natural regeneration • Inspections / re-surveying / aftercare eg beating up, individual tree management plans, tree risk management survey • Awareness and protection of soil condition • Support and protection eg guards, fencing, mammal control • Pruning conventions eg use within trees, wound occlusion, timing of operations, CODIT, wound wood • Equipment and resources eg machinery, PPE, pruning equipment **Band 1: 1-4 marks** Basic discussion with limited range and depth. Few links made to the scenario. Comparisons are not well developed or balanced with limited considerations given to tree stock, planting and aftercare. **Band 2: 5-8 marks** Adequate discussion with good range and depth. Good links made to the scenario. Comparisons are well developed and balanced with some considerations given to tree stock, planting and aftercare. **Band 3: 9-12 marks** Comprehensive discussion with extensive range and depth. Clear links made to the scenario. Comparisons are detailed and well balanced with thorough considerations given to tree stock, planting and aftercare.		12